



**FINAL**  
**Human Health Risk Assessment**

**American Chemical Services**  
**Griffith, Indiana**

**Prepared under**  
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## Executive Summary

In September of 1998, Black and Veatch Special Projects Corp. (BVSPC) was tasked by the United States Environmental Protection Agency (USEPA), Region V to revise a human health risk assessment performed by ENVIRON Corporation for the American Chemical Services (ACS) site according to USEPA comments dated August 19, 1998 (USEPA 1998e). In addition, BVSPC was tasked by USEPA to place all tables supporting the risk assessment into the Risk Assessment Guidance for Superfund (RAGS), Part D format (USEPA 1998a). In accordance with the aforementioned USEPA tasks, this risk assessment depends largely upon the original ENVIRON ACS Risk Assessment (RA) for much of its form, content, and methodology. Significant portions of the ENVIRON RA text, where in conformity with USEPA methodology, are reproduced and referenced here. Likewise, the figures contained in the ENVIRON report are reproduced, referenced, and contained within. However, all the tables following the text of this report are not ENVIRON's or modified ENVIRON tables. BVSPC regenerated all the tables de novo from the environmental sampling data.

The ACS site is located at 420 South Colfax Avenue, in the Town of Griffith, Indiana. ACS, which owns approximately 26 acres of the Site and leases another four acres from CSX, began solvent recovery operations at the Site in May 1955. The area around the site has historically been developed for industrial and commercial uses and is referred to as the "eastern portion of the Town" in the Master Plan for the Town of Griffith, Indiana (i.e., including all lands east of Broad Street between the Penn Central and C & E Railroads). The entire "eastern portion of the Town," including the Site, is currently zoned for industrial use. A map showing the location of the Site is provided in Figure 3-1. For the purposes of the baseline human health risk assessment, the evaluated on-Site and off-Site areas have been divided into the eight exposure areas shown in Figure 3-2 and described in greater detail in Section 3.2. These eight exposure areas are:

### **On-Site Areas**

- Area 1: On-Site Containment and Still Bottoms/Treatment Lagoon Area
- Area 2: Off-Site Containment Area
- Area 3: Kapica-Pazmey Area
- Area 4A: Wetlands Area
- Area 4B: North Area

### **Off-Site Area**

- Area 5A: Off-Site - East

- Area 5B: Off-Site - North
- Area 6: Off-Site - West

The exposure populations evaluated for risk of exposure to soil, sediment, surface water, and groundwater in these areas are as follows:

- On-site routine workers
- On-site utility workers
- On-site construction workers
- On-site trespassers
- Off-site residents (child and adult)
- Off-site construction workers
- Off-site commercial workers

USEPA Directive 9355.0-30 states that cumulative site cancer risks of less than 1 in 10,000 ( $1 \times 10^{-4}$ ) or hazard indices less than 1 indicate that remedial action is generally unnecessary unless on-site levels of a contaminant exceed chemical specific standards (e.g., MCLs, maximum contaminant level goals, etc.) or there are "imminent and substantial" adverse environmental impacts (USEPA 1991b). Almost all On-site and Off-site receptor populations evaluated in this risk assessment exceed a total cancer risk of  $1 \times 10^{-4}$  and/or a hazard index of 1. The only exceptions are the central tendency trespassers in Areas 4A and 4B and the central tendency adult residents in Area 6. The receptor populations with the highest cancer risk and/or hazard index in each of the eight exposure areas are described below.

The receptor population with the highest cancer risk in On-site Areas 1, 2, 3, and 4B is the utility worker. The cancer risks for utility workers ranged from  $3 \times 10^{-2}$  to  $2 \times 10^{-1}$ . The receptor population with the highest hazard indices in On-site Areas 1, 2, 3, and 4B is the construction worker. The hazard indices for construction workers ranged from 4,300 to 9,300. Onsite workers (includes routine and utility workers) exposed to site-wide groundwater have a cancer risk of  $3 \times 10^{-1}$  and a hazard index of 19. Trespassers are the maximum exposed receptor population in Area 4A with a cancer risk of  $2 \times 10^{-5}$  and a hazard index of 4. In Areas 5A and 6, the maximum exposed populations are residents (excess lifetime cancer risks ranging from  $5 \times 10^{-5}$  to  $7 \times 10^{-4}$ ) and child residents (hazard indices ranging from 3 to 580). The maximum exposed populations in Area 5B are commercial workers (cancer risk of  $5 \times 10^{-3}$ ) and construction workers (hazard index of 420).

The risks and hazard indices discussed in the preceding paragraph are generated by a limited list of organic and inorganic contaminants. This risk assessment determined that the following

organic contaminants are present on-site and off-site at relatively high concentrations (i.e., concentrations which, collectively, or individually, generate cancer risks or hazard indices in one or more exposure populations greater than  $1 \times 10^{-4}$  or 1, respectively). The sample locations of the maximum detection (Figure 3-3 and 3-4) for each contaminant identified below follows in parentheses.

- **Area 1 Surface and Subsurface Soil**

Aroclor - 1242	(TP02-03)
Aroclor - 1254	(TP02-03)
Benzene	(TP02-03)
Chloroform	(TP06-04)
Tetrachloroethene	(TP02-03)
Toluene	(TP02-03)
Trichloroethene	(SB92-03)
1,1,1-Trichloroethane	(TP07-03)

- **Area 2 Surface and Subsurface Soil**

Acetone	(SA04-0)
Aldrin	(SB39-10)
Aroclor 1254	(T12-S and SB37-10)
Aroclor 1260	(SA02-S and SB78-07)
Chloroform	(SA04-0)
Tetrachloroethane	(SA04-0 and SA04-S)
Toluene	(SA04-0)
1,1,1-Trichloroethane	(SA04-0)

- **Area 3 Surface and Subsurface Soil**

Acetone	(SB30-10)
Aroclor 1242	(TP01-03_5)
Aroclor 1248	(SB48-01 and KP01-S)
Aroclor 1254	(SB48-01 and SB30-10)
Aroclor 1260	(SP02-S)
Bis (2-ethylhexyl) phthalate	(SB30-10)
Benzene	(SB30-10)
Ethylbenzene	(SB30-10)

Tetrachloroethene	(SA02-03 and SB30-10)
Toluene	(SB30-10)
Trichloroethene	(SA02-03 and SB30-10)
4-methyl-2-pentanone	(SB30-10)
1,1,1-Trichloroethane	(SB30-10)

- **Area 4B Sediment**

Aroclor 1254	(ST11-101)
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- **Area 5A Surface Soil**

Aroclor 1254	(SS02-001)
--------------	------------

- **Upper Aquifer (On-Site)**

Aroclor 1248	(MW04)
--------------	--------

Benzene	(MW03)
---------	--------

Ethylbenzene	(MW05)
--------------	--------

Toluene	(MW03)
---------	--------

- **Upper Aquifer (Off-Site, Area 5A)**

Benzene	(MW06)
---------	--------

Bis (2-ethylhexyl) phthalate	(MW06)
------------------------------	--------

Di-n-octyl phthalate	(MW06)
----------------------	--------

Ethylbenzene	(MW06)
--------------	--------

Pentachlorophenol	(MW06)
-------------------	--------

Xylene	(MW06)
--------	--------

- **Upper Aquifer (Off-Site, Area 5B)**

Benzene	(MW48)
---------	--------

- **Lower Aquifer (On-Site)**

Ammonia	(MW09)
---------	--------

Benzene	(MW09)
---------	--------

Bis (2-chloroethyl) ether	(MW09)
---------------------------	--------

Bis (2-ethylhexyl) phthalate	(MW23)
------------------------------	--------

- **Lower Aquifer (Off-Site, Private Wells)**

Chloroform	(PWC-01)
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- **Lower Aquifer (Off-Site, Monitoring Wells)**

Bis (2-ethylhexyl) phthalate	(MW36)
------------------------------	--------

The off-site private wells in Area 5A are used to evaluate current risks to residents using the lower aquifer. The off-site monitoring wells in Area 5A are used to evaluate future risks to residents using the lower aquifer. The on-site lower aquifer wells were used to evaluate future exposure to downgradient commercial workers (e.g., car wash). The receptor populations with the highest carcinogenic risks and noncarcinogenic risks in each area are discussed in Section 5.0.

The following inorganics were discovered on-site and off-site at concentrations high enough to generate cancer risks in one or more receptors greater than  $1 \times 10^{-4}$  or hazard indices greater than 1:

- **Area 1 Surface and Subsurface Soil**
  - Antimony (TP06-04)
  - Beryllium (TP06-04)
  - Cadmium (TP06-04)
- **Area 2 Surface and Subsurface Soil**
  - Antimony (DS01-S)
  - Cadmium (DS01-S)
  - Chromium (DS01-S)
- **Area 3 Surface and Subsurface Soil**
  - Antimony (SA02-03 and SB30-10)
  - Barium (SB30-10)
  - Cadmium (SA02-03 and SB30-10)
  - Copper (SB30-10)
- **Area 5A Surface Soil**
  - Antimony (SS02-01)
- **Area 6 Sediment**
  - Arsenic (SD13-01)
  - Iron (SD14-01)
- **Upper Aquifer (On-Site)**
  - Arsenic (MW05)
  - Beryllium (MW48)
- **Upper Aquifer (Off-Site, Area 5A)**
  - Arsenic (MW06)
  - Antimony (MW06)
  - Iron (MW06)

- |           |        |
|-----------|--------|
| Manganese | (MW06) |
|-----------|--------|
- **Upper Aquifer (Off-Site, Area 5B)**

Beryllium	(MW48)
-----------	--------
  - **Lower Aquifer (On-Site)**

Arsenic	(MW52)
Barium	(MW53)
Cadmium	(IW6)
Chromium	(MW10C)
Iron	(MW24)
Manganese	(MW24)
  - **Lower Aquifer (Off-Site, Private Wells)**

Antimony	(PWX-01)
Arsenic	(PWS-01)
Iron	(PW02)
Manganese	(PWK-01)
Zinc	(PWO-01)
  - **Lower Aquifer (Off-Site, Monitoring Wells)**

Arsenic	(MW28)
Barium	(MW22)
Beryllium	(MW28)
Chromium	(MW28)
Iron	(MW50)
Manganese	(MW36)
Nitrate	(MW07)
Thallium	(MW22)

All of the inorganics in the above well locations are less than their corresponding federal MCL except arsenic in MW-52 at a concentration of 130 µg/L (MCL = 50 µg/L) and cadmium in IW-6 at 36 µg/L (MCL = 5 µg/L).

In addition to the inorganics listed above, lead was also evaluated. The results of the evaluation are as follows:

- The current child exposure to lead in Area 5A private wells is slightly above USEPA acceptable levels due to a lead concentration of 22.6 µg/L in private well PWD-01.

- Future child exposures to lead in Area 5A monitoring wells are below USEPA acceptable levels.
- Current/future fetal blood lead levels of current/future routine workers in Areas 2 and 3 exceed USEPA acceptable limits due to their parents exposure to lead in soil (0-10 feet).
- Future fetal blood lead levels of construction workers in Areas 1, 2 and 3 exceed USEPA acceptable limits due to their parents exposure to lead in soil (0-4 feet and 0-10 feet).
- Future fetal blood lead levels of trespassers exceeded USEPA acceptable limits only in Area 3 due to their parents exposure to lead in soil (0-10 feet).

Areas 1, 2 and 3 contain buried waste and drums that have never been fully characterized. These drums represent a potential risk of acute exposure or explosion from general deterioration/mixing of contents and from vehicular puncture. In order to quantitatively estimate the risk associated with these exposures in these areas, further investigation would be required.



## **3.0 Exposure Assessment**

The purpose of the exposure assessment is to evaluate the nature and magnitude of potential exposures to contaminants detected at the site during the RI and subsequent site characterization studies. The exposure assessment consists of the following components:

- Characterization of Exposure Setting (Section 3.1);
- Identification of Potential Exposure Routes and Pathways (Section 3.2);
- Exposure Concentrations (Section 3.3); and
- Estimation of Media Intake (Section 3.4).

The results of the exposure assessment are combined with the results of the toxicity assessment (Section 4) to characterize potential risk (Section 5).

### **3.1 Characterization of Exposure Setting**

In the baseline risk assessment, the exposure setting is evaluated with respect to the general characteristics of the site and site surroundings, and potentially exposed populations, under both current and reasonably anticipated future land use conditions. Section 3.1.1 provides a general description of the current exposure setting at and around the site. Section 3.1.2 describes the exposure setting under a reasonably anticipated future land use scenario. Hypothetically exposed populations under current and future conditions are summarized in Section 3.1.3.

#### **3.1.1 Current Exposure Setting**

The site is located at 420 South Colfax Avenue, in an area of the Town of Griffith that historically has been developed primarily for industrial and commercial uses. The part of Griffith in which the site is located is referred to as the "eastern portion of the Town" in the Master Plan for the Town of Griffith, Indiana (i.e., including all lands east of Broad Street between the Penn Central and C & E Railroads). The entire "eastern portion of the Town," including the site, is zoned for industrial use (ENVIRON 1998). A map showing the location of the site is provided in Figure 3-1. For the purposes of the baseline risk assessment, on-site and off-site areas have been divided into eight Exposure Areas, shown in Figure 3-2 and described in greater detail in Section 3.2.

ACS, which owns approximately 26 acres of the site and leases another four acres from CSX, began operations at the site as a solvent recovery facility in May 1955. Through the nearly 42 years of continuous operation, ACS has modernized, modified, and expanded operations at the site. For example, in the 1960s ACS added facilities to manufacture small

batches of specialty chemicals and in the 1970s built an epoxidation plant to produce a plasticizer. ACS currently employs over 40 full-time workers and intends to continue specialty chemical manufacturing and epoxidation operations at the site (ENVIRON 1998).

The ACS property is bisected by the Chesapeake & Ohio (C&O) Railroad (see Figure 3-2, Areas 1 and 2). The active facility is located in Area 1, north of the railroad, and contains two areas where waste drums were buried: the On-site Containment Area and the Still Bottoms/Treatment Lagoon Area. In the On-site Containment Area, an estimated 400 to 2,500 drums containing sludge and semi-solids of uncharacterized waste are located approximately one to five feet below ground surface (Warzyn, Inc. 1991a; Focus Environmental 1997; GeoPhysical 1998). The Still Bottoms Pond and Treatment Lagoon #1 were located in the mid-southern portion of Area 1 and were filled in with crushed drums partially full of sludge materials in the early 1970s (Warzyn, Inc. 1991a). Currently, the Still Bottoms/Treatment Lagoon Area is covered by crushed gravel, aboveground holding tanks, and a parking lot. The surface throughout Area 1, including the On-site Containment Area and Still Bottoms/Treatment Lagoon Area, is generally devoid of vegetation and covered by approximately six inches of aggregate and/or coarse sand and gravel. ACS has provided regular maintenance of this cover (ENVIRON 1998).

The undeveloped portion of the ACS property (Area 2 on Figure 3-2) is located south of the C&O Railroad. This area includes the "Off-site Containment Area," which was used for waste disposal between 1958 and 1975, when it was bermed and capped with clay (Warzyn, Inc. 1991a). A variety of wastes are reportedly present below the cover, including general refuse, still bottoms, ash from the on-site incinerator, and the remains of an estimated 25,000 to 55,000 drums (Focus Environmental 1997). According to ACS, Inc., most of the drums in Area 2 are not intact, having been punctured or crushed prior to disposal (Warzyn, Inc., 1992, Montgomery Watson 1995). Observations in test pits (Focus 1997) confirm this. Currently, Area 2 is generally covered by a one-foot deep clay cover and temporary spoils piles generated during remediation activities at the site. The spoils piles have PVC coverings. Recent observations in this area of the site have noted that the PVC coverings have deteriorated and that the clay cap has eroded away exposing drum-tops (BVSPC 1998a). In addition, many drums have been stored above ground and uncovered in this area.

In addition to the ACS property, the site includes two acres that also have a history of industrial use. These two acres are located south of the ACS property and adjacent to the Griffith Municipal Landfill (Area 3 on Figure 3-2). Kapica Drum, Inc., began drum reconditioning operations on this portion of the site in 1951. Pazmey Corporation bought the property in February 1980 and continued drum reconditioning operations until March 1987, when Darija Djurovic purchased the property for automobile storage and repair.

The site also includes four acres that ACS leases from CSX, located to the north of the active facility (Area 4B on Figure 3-2). Area 4B is currently undeveloped and heavily vegetated. It is bordered to the west and north by wetlands.

The land surrounding the site is currently zoned for industrial use, but historically has been used for a combination of industrial, residential, and recreational purposes. In the following paragraphs, current land uses in the vicinity of the site are described in a clockwise fashion, beginning at the northeast corner. The area surrounding the site and the roads and railroads immediately adjacent to the site are labeled in Figure 3-2.

Located northeast of the site, beyond the intersection of Colfax Avenue and the Grand Trunk Railroad right-of-way, are the Oak Ridge Prairie County Park and the Griffith Airport. Immediately east of the site and north of the C&O Railroad right-of-way, the land is undeveloped and zoned general industrial (ENVIRON 1998). To the east of Colfax Avenue and south of the C&O Railroad right-of-way are several small businesses. To the east of Colfax Avenue and along Reder Road, several small businesses and several single family residences are present (this area is labeled Area 5A on Figure 3-2). South of the intersection of Reder Road and Colfax Avenue, on Arbogast Avenue, are a private residence and a small industrial building. The area was zoned for industrial use after the residences were built, with the intention that any future development in the area would be industrial. The pre-existing residences in the industrial zone are considered conforming uses, and a zoning ordinance cannot force changes in these existing uses. However, new residences would be considered non-conforming and the ordinance can prevent construction of a non-conforming use. In addition, if the pre-existing residential use is discontinued, the ordinance can also prevent it from being resumed (Sargent 1997).

To the west and southwest of the site, south of the C&O Railroad right-of-way, are the Griffith Municipal Landfill and Town of Griffith Municipal Garage. Beyond the municipal landfill and west of the Chicago and Erie (C&E) Railroad right-of-way, are vacant land and a residential development (Area 6 on Figure 3-2). This area is zoned for residential use.

North of the C&O Railroad right-of-way to the west of the site (Area 4A on Figure 3-2), and north of the Grand Trunk Railroad right-of-way (Area 5B on Figure 3-2) the land is primarily vacant, and classified as wetlands. Further to the north, along Main Street, are small businesses and an industrial park.

### **3.1.2 Reasonably Anticipated Future Exposure Setting**

Reasonably anticipated future exposure settings for evaluation in the baseline risk assessment have been developed based on USEPA's "Land Use in the CERCLA Remedy Selection Process" (USEPA 1995a). This guidance presents framework and specific factors

to be used in determining the reasonably anticipated land use for the purpose of estimating potential future risks. Based on USEPA guidance (1995a), a comprehensive review of information pertinent to future land use patterns on and around the site has been conducted, as presented in Appendix A.

Site-specific information consulted in developing the reasonably anticipated future exposure setting at the ACS site includes the following:

- Master Plan for the Future Land Use, Griffith, Indiana;
- Official Zoning Map for Town of Griffith;
- Personal communications with the Building Commissioner of Griffith;
- Information from the Northwestern Indiana Regional Planning Commission (NIRPC)<sup>1</sup>;
- U.S. Census data;
- U.S. topographic, wetland inventory, and flood plain maps;
- Declarations of Land Use Restriction of Real Property; and
- Information from the Historic Landmarks Foundation of Indiana.

The Master Plan for Griffith (Vilizan-Leman 1975) is used by the Town government to guide future development in Griffith.

A comprehensive review of information pertinent to future land use patterns surrounding the site confirms that the assumption of continued industrial land use at the site is appropriate (see Appendix A). Given the history of industrial land use at the site, ACS's plans for continuing operations, the Town of Griffith's plans for continuing industrial/commercial development surrounding the site, and the aesthetic unsuitability of the site's location for residential development, the probability is low that the location of the site would support residential use in the future (ENVIRON 1998). The limited population growth expected in the future and Griffith's plans to direct the potential growth away from the site also indicate a low probability of future residential land use at the site.

Thus, the future exposure setting for all on-site areas is assumed to be industrial/commercial. The future exposure setting for all off-site areas is assumed to also include residential use, given the current existence of homes in the industrially zoned areas adjacent to the site.

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<sup>1</sup>NIRPC is a multi-purpose, area-wide planning agency representing local governments within Lake, Porter, and LaPorte Counties; at least two-thirds of the Commission must be local officials.

### **3.1.3 Summary of Potentially Exposed Populations**

Based on the exposure settings described in Sections 3.1.1 and 3.1.2, the baseline risk assessment evaluates the following land uses, under both current and reasonably anticipated scenarios:

- Industrial land use at the site; and
- Industrial/commercial, residential, and recreational land uses surrounding the site.

The exposure populations considered in the risk assessment under these land use scenarios are:

- **On-site Workers - Routine Operations**

The majority of workers at the ACS facility are employed in manufacturing functions which take place within manufacturing buildings. These workers rarely, if ever, perform job functions that bring them into direct contact with soil or groundwater at the site. Routine incidental contact with outdoor areas at the facility may occur during breaks and walks to and from parking lots. The extent of such outdoor activities is expected to vary seasonally, and to differ from area to area at the site (ENVIRON 1998).

- **On-site Workers - Utility Excavation**

A small number of the facility's workers may be involved in occasional outdoor maintenance activities (e.g., replacing the aggregate covering the site), or occasional excavation activities (e.g., to maintain underground utility lines at the site) in addition to routine manufacturing work. The extent of contact during excavation activities is expected to vary seasonally, and to differ from area to area at the site (ENVIRON 1998).

- **On-site Workers - Construction**

- Several areas of the site are not developed and may require construction of buildings prior to industrial use. Such construction could involve more extensive excavation than for utility line maintenance. Contact during construction activities would be limited to the building season (i.e., nine months of the year).

- **On-site Trespassers**

Public access to portions of the site is controlled by perimeter fencing that is inspected monthly. In addition, the presence of the active ACS facility discourages unauthorized entry to the site. Several outdoor recreational areas are located nearby, further reducing the potential for trespassing at the site. Trespassing has been observed in the unfenced portions of the site, but not in the fenced portions (ENVIRON 1998). Nevertheless, this population is assessed for risk under current and future land-use.

- **Off-site Residents**

The nearest residences to the site are located east of the site along Reder Road and Colfax Avenue (Area 5A, Figure 3-2). Additional residences are located beyond the Griffith Municipal Landfill and C&E railroad right-of-way, west and southwest of the site (Area 6, Figure 3-2).

- **Off-site Workers**

Various commercial and industrial properties are located to the north, east, and south of the site.

### **3.2 Identification of Potential Human Exposure Routes and Pathways**

The potential routes of human exposure evaluated in the baseline risk assessment are ingestion, dermal contact, and inhalation. In some cases, chemicals may migrate through an "exposure pathway" from a source to a location where exposure through one or more of these routes could potentially occur.

For an exposure pathway to be complete, the following elements are required: (1) a source and a mechanism of contaminant release; (2) a transport medium; (3) a point of potential human contact with the affected medium (i.e., an exposure area); and (4) an exposure route at the point of contact. Based on a consideration of exposure routes and complete exposure pathways, the following eight exposure areas have been evaluated in this risk assessment:

#### **On-site Areas**

- Area 1: On-site Containment and Still Bottoms/Treatment Lagoon Area
- Area 2: Off-site Containment Area
- Area 3: Kapica-Pazmey Area
- Area 4A: Wetlands Area
- Area 4B: North Area

#### **Off-site Area**

- Area 5A: Off-site - East
- Area 5B: Off-site - North
- Area 6: Off-site - West

These areas represent potential points of contact with affected media, based on the current and reasonably expected future exposure settings at and around the ACS site. Each exposure area is shown in Figure 3-2.

Sections 3.2.1 through 3.2.8 below describe the exposure areas included in the baseline risk assessment, and the potential exposure routes and pathways that are quantitatively evaluated for each area. The potential exposure pathways for each Area are summarized in Tables 3-1 through 3-8.

### **3.2.1 Area 1: On-site Containment and Still Bottoms/Treatment Lagoon Area**

Area 1 is the active manufacturing area of the ACS property and consists of approximately 15 acres located north of the C&O Railroad. It is surrounded by a fence and includes the On-site Containment Area and the Still Bottoms/Treatment Lagoon Area. Current and potential future receptors evaluated in the risk assessment for Area 1 are: (1) routine workers; and (2) utility workers. Trespassing has not been observed in Area 1 under current conditions, but trespassers are assumed to be an additional potential future receptor in this area. Due to physical restraints posed by the shallow groundwater table in this area, future construction would probably be of the slab-on-grade variety involving shallow excavation; therefore, a typical construction worker scenario is not evaluated for Area 1. However, exposure to shallow groundwater by future construction workers during shallow excavations, 0 to 4 feet below ground surface (bgs), is evaluated for dermal and inhalation risk.

Following closure of the disposal areas at the ACS facility (i.e., the On-site Containment Area and the Still Bottoms/Treatment Lagoon Area) in the 1970s, wastes were covered with at least one foot of clean fill material. In addition, ACS currently maintains a six-inch aggregate cover over most of the manufacturing area. This cover is added to and regraded periodically, as needed (ENVIRON 1998). However, in order to quantitatively establish the need to maintain this cover, current and future on-facility workers are assessed for contact with surface soils during routine activities in Area 1. Because the future composition of surface soil cannot be predicted with certainty and may be some combination of what is currently considered surface and subsurface, future risks to on-facility workers and trespassers were estimated by including all sample results from 0 to 10 feet bgs and then calculating a reasonable maximum exposure concentration for the entire depth-range.

It has been assumed that both current and future exposure of on-site and off-site receptors could potentially occur via inhalation of vapors emitted from undisturbed soil above the groundwater table in Area 1. However, only on-site inhalation risks are quantitatively evaluated. Vapor emissions from groundwater would be significantly less than emissions from soil above the groundwater table. Potential off-site inhalation exposures are evaluated for off-site residents nearest to Area 1, and thus are considered conservative, screening-level estimates.

Exposures could also potentially occur in limited portions of Area 1 if excavation through the aggregate and clean fill is necessary to maintain underground utilities. To conservatively estimate these potential exposures, it is assumed that excavations could occur anywhere in Area 1. Due to the shallow depth to groundwater in Area 1 (approximately two to eight feet below ground surface) (Warzyn, Inc. 1991a), exposure to both subsurface soil and groundwater in an excavation pit may occur during maintenance of utility lines, which are typically located three to seven feet below ground surface. Under current conditions, contact with these media is not anticipated because all workers performing excavations at the ACS site are required to wear personal protective equipment as specified in the *ACS Site Safety and Health Plan* (ACS 1997).

However, in order to establish the need for these protective measures, the baseline risk assessment evaluates both current and future exposures by underground-utility workers, assuming that protective equipment may not be worn during excavation activities. In such cases, the primary potential routes of exposure for excavation workers would be incidental ingestion of soil, dermal contact with soil, dermal contact with shallow groundwater entering into an excavation pit, and inhalation of vapor and particulates from soil and exposed groundwater. Incidental ingestion of groundwater is judged to be relatively insignificant and is not evaluated.

Since Area 1 is currently used by ACS for manufacturing operations, USEPA has requested an evaluation of the potential adverse consequences of truck traffic over the drum landfill. Very limited data are available regarding specific contaminant concentrations in the drummed materials, preventing a quantitative analysis of risks posed by trucks driving over the drum landfill. However, to address USEPA's concerns, a qualitative discussion of the potential risks of truck traffic over the drums in Area 1 is presented in Section 5.3.

Off-site residents could also conceivably be exposed to emissions from soil during periods of excavation in Area 1, under both current and future conditions. However, due to the short duration and frequency of excavations, these risks were assumed to be insignificant; therefore, this pathway will not be discussed further in this risk assessment.

In the past, ACS has used lower aquifer production wells for process water in a closed system. Currently, all production wells are sealed and the ACS facility relies on municipal water only. In addition, ACS has placed a deed restriction on the property to restrict use of groundwater for drinking water and irrigation. Thus, exposure to groundwater in Area 1 is not likely to occur (ENVIRON 1998). However, in order to establish the quantitative need for deed restrictions and in the event that production wells are reinstalled in the future to supplement the municipal water, it is assumed that current and future workers could conceivably be exposed to lower aquifer groundwater via ingestion and showering.



### **3.2.2 Area 2: Off-site Containment Area**

Area 2 is the Off-site Containment Area. It consists of approximately 11 acres and is bounded to the north by the C&O Railroad, to the west by the Griffith Municipal Landfill, to the south by the former Kapica-Pazmey property, and to the east by Colfax Road. Area 2 is a fenced but undeveloped property owned by ACS. No trespassing has been observed in Area 2 and the fence is checked monthly (ENVIRON 1998). However, in order to establish the quantitative need for these control measures (i.e., fence maintenance), current exposures to trespassers are evaluated for risk. Although ACS has no plans to sell this property, or to develop it for any purpose, it is conceivable that Area 2 could be developed for industrial use in the future. Should this area be developed for industrial purposes, potentially exposed future individuals in Area 2 could potentially include routine workers, utility workers, construction workers, and trespassers.

The portion of Area 2 where waste disposal reportedly occurred was covered by more than one foot of clay after the disposal activities ceased. If intact, such a clay cap would eliminate direct contact with subsurface materials and reduce the magnitude of vapor emissions. Although the initial clay cap was disturbed in several locations during site characterization and remediation activities, a new clay cap (one-foot deep) has been placed over Area 2 (ENVIRON 1998). However, recent field observations noted numerous locations where this new cap had eroded, exposing drums at the surface (BVSPC 1998a).

Under current conditions, it is assumed that trespassers could be exposed to soil below the cap through incidental ingestion, dermal contact, and inhalation, and that exposures of off-site residents could occur via inhalation of vapors from undisturbed subsurface soil in Area 2. Potential exposures of off-site residents are evaluated by estimating vapor concentrations in air at the off-site residences nearest to Area 2, and thus are considered conservative, screening-level estimates.

If Area 2 were to be developed for industrial purposes, exposures of future routine workers could potentially occur via direct contact with surface soils and inhalation of vapor emissions from surface and subsurface soil. The future composition of surface soil cannot be predicted with certainty, and may be some combination of what is currently considered surface and subsurface. Due to ongoing remediation investigations and activities, no samples have been collected from 0 to 2 feet; thus, the current surface concentrations have not been characterized. Therefore, the risk assessment includes an estimate of potential future risks to on-facility workers based on subsurface soil concentrations only. The data set used to evaluate this scenario was collected from 2 to 10 feet.

In addition, current and future excavation activities to maintain underground utilities could also result in exposures to subsurface soil in Area 2 if personal protective equipment were not

worn. To quantify potential exposures during underground-utility maintenance, it is assumed that excavations could occur to a depth of 10 feet anywhere in Area 2. The primary potential routes of exposures for utility workers in Area 2 are ingestion of soil, dermal contact with soil, and inhalation of vapor and particulates from exposed soil. Since the water table is somewhat deeper in Area 2 than in Area 1 (generally 10 to 16 feet below ground surface, except at locations immediately adjacent to Area 1), contact with groundwater in an excavation pit is not likely to occur and is not evaluated.

If Area 2 were to be developed for industrial purposes, building construction involving extraction of soils may also occur. Exposures of future construction workers could potentially occur via incidental ingestion of and dermal contact with soil and inhalation of vapor and particulate emissions from soil. Two construction scenarios are evaluated: (1) the construction of a slab-on-grade building, such as a warehouse, assuming footings excavated to a depth to four feet; and (2) construction of a building requiring excavations to a depth of up to 10 feet.

Off-site residents could also be exposed via inhalation of vapor and particulate emissions from soil during periods of excavation for utility maintenance or construction in Area 2, under future conditions. However, due to the short duration and frequency of excavations, these risks were assumed to be insignificant; therefore, this pathway will not be discussed further.

As mentioned previously, municipal water is readily available to the site. Thus, future industrial development of Area 2 is likely to include connection to the municipal supply rather than construction of wells, and exposure to on-site groundwater is unlikely to occur (ENVIRON 1998). However, in the event that on-site production wells are established in the future to supplement the municipal water (e.g., for ingestion or showering), it is assumed that workers could conceivably be exposed to lower aquifer groundwater in the future.

### **3.2.3 Area 3: Kapica-Pazmey Area**

The 2-acre Kapica-Pazmey Area is located to the south of the Off-site Containment Area (i.e., Area 2) and is bounded to the west and south by the Griffith Municipal Landfill. As with Area 2, this area is currently fenced and undeveloped, but could conceivably be developed for industrial purposes in the future. Thus, current receptors for Area 3 are trespassers, utility workers, and receptors in other areas who may inhale emissions from Area 3.

Potential exposures of off-site residents may occur via inhalation of vapor and particulate emissions from soil in this area. However, due to the short duration and frequency of excavations, these risks were assumed to be insignificant.

If Area 3 is developed for industrial purposes, exposures of future routine workers could occur via ingestion and dermal contact with surface soil, and inhalation of vapor and

particulate emissions from soil. Because the future composition of surface soil cannot be predicted with certainty, and may be some combination of what is currently considered surface and subsurface, current and future risks to on-facility workers and future risks to trespassers were estimated by including all sample results from 0 to 10 feet bgs and then calculating a reasonable maximum exposure concentration for the entire depth-range.

In addition, current and future excavation activities to maintain underground utilities could result in exposures to subsurface soil in Area 3 if protective equipment were not worn. To quantify potential exposures during underground-utility maintenance, it is assumed that excavations could occur to a depth of 10 feet anywhere in Area 3. The primary potential routes of exposure for excavation workers are ingestion of soil, dermal contact with soil, and inhalation of vapor and particulates from exposed soil. Due to the depth of the water table in Area 3 (approximately 10 to 16 feet below ground surface), contact with groundwater in an excavation pit is not expected to occur and thus is not evaluated.

If Area 3 were to be developed for industrial purposes, building construction involving excavation of soils may also occur. Exposures of future construction workers could potentially occur via incidental ingestion of and dermal contact with soil and inhalation of vapor and particulate emissions from soil. Two construction scenarios are evaluated: (1) the construction of a slab-on-grade building, such as a warehouse, assuming footings excavated to a depth of four feet; and (2) construction of a building requiring excavations to a depth of up to 10 feet.

Off-site residents may also be exposed to vapor and particulate emissions from soil during periods of excavation for utility maintenance or construction in Area 3, under future conditions. However, due to the short duration and frequency of excavations, these risks were assumed to be insignificant; therefore, this pathway will not be discussed further.

As mentioned previously, municipal water is readily available to the site. Thus, future industrial development of Area 3 is likely to include connection to the municipal supply rather than construction of wells, and exposure to on-site groundwater is unlikely to occur (ENVIRON 1998). However, in the event that on-site production wells are established in the future to supplement the municipal water (e.g., for ingestion or showering), it is assumed that workers could conceivably be exposed to lower aquifer groundwater in the future.

### **3.2.4 Area 4A: Wetlands Area**

Area 4A is located between the Grand Trunk Railroad and the C&O Railroad right-of-ways, west of the fence line of Area 1. This approximately 25-acre area is primarily wetlands and is unlikely to be developed in any way due to Federal Clean Water Act prohibitions on wetland development (42 U.S.C. 1311 and 1344).

Under current and future conditions, potential exposure of trespassers may occur via incidental ingestion and dermal contact with sediment and surface water, and via inhalation of vapor emitted from surface water in Area 4A.

### **3.2.5 Area 4B: North Area**

Area 4B consists of six acres located north of Area 1 and south of the Grand Trunk Railroad right-of-way and is heavily vegetated and undeveloped. This area is evaluated separately from Area 4A because it is not classified as wetlands, and thus could potentially be developed for industrial purposes in the future. Under current land use, trespassers are the only potential receptors in Area 4B. Should this area be developed for industrial purposes, future receptors could include routine workers, excavation workers for utility maintenance, and trespassers. Due to physical restraints posed by the shallow groundwater table in this area, future construction would probably be of the slab-on-grade variety involving shallow excavation; therefore, a typical construction worker scenario is not evaluated for Area 4B. However, exposure to shallow groundwater by future construction workers during shallow excavations (0 to 4 feet bgs) is evaluated for dermal and inhalation risk.

Under current and future conditions, potential exposure of trespassers may occur via ingestion and dermal contact with sediment and surface water, and via inhalation of vapor emitted from groundwater in Area 4B.

Should this area be developed for industrial purposes in the future, potential exposure of workers may occur via ingestion and dermal contact with sediment and surface water, and via inhalation of vapor emitted from groundwater in Area 4B. No contaminants have been detected in subsurface soil from this area, so the evaluation of potential future exposures is conservatively based on surface soil concentrations only.

The baseline risk assessment evaluates potential future exposures by utility workers, assuming that protective equipment may not be worn during excavation activities. In such cases, the primary potential routes of exposure for excavation workers would be incidental ingestion of sediment, dermal contact with sediment, dermal contact with groundwater entering into an excavation pit, and inhalation of vapor and particulates from exposed groundwater. Ingestion of groundwater is judged to be relatively insignificant and is not evaluated.

As mentioned previously, municipal water is readily available to the site. Thus, future industrial development of Area 4B is likely to include connection to the municipal supply rather than construction of wells, and exposure to on-site groundwater is unlikely to occur (ENVIRON 1998). However, in the event that on-site production wells are established in the future to supplement the municipal water (e.g., for ingestion or showering), it is assumed that workers could conceivably be exposed to lower aquifer groundwater in the future.

### **3.2.6 Area 5A: Off-site East**

Area 5A consists of off-site properties to the east and southeast of the site that are zoned for industrial use only, but include existing residential development. Current and future potential receptors in Area 5A include both off-site residents and off-site workers. As off-site worker exposures are expected to be lower than potential residential exposures in Area 5A, only residential exposures are quantified in the risk assessment. Risks are calculated for both child and adult residents.

As discussed in Sections 3.2.1 through 3.2.5, residents could be exposed via inhalation of soil vapor and particulates from on-site areas, both during routine operations and during excavation in those areas. However, due to the short duration and frequency, risks resulting from excavations were not evaluated. Site-related contaminants may also migrate to off-site soils via deposition of airborne particulates or via groundwater discharge to the surface. Residences near the site are not located at groundwater discharge points and deposition of particulate emissions from the site is not expected to be significant. However, as a conservative measure, the baseline risk assessment evaluates potential residential exposure to off-site soil based on the results of supplemental off-site samples collected by USEPA in September 1997.

Most residents of Griffith rely on the municipal water supply system for drinking water (Warzyn, Inc. 1991b). Conditions at the site do not and cannot affect the quality of the municipal water supply, as this water is drawn from Lake Michigan (NIPSC 1992). However, residents in Area 5A do use well water and therefore, exposures to contaminants in groundwater in Area 5A can occur during potable use through ingestion, dermal contact, and inhalation. Potential exposures of off-site adult residents to contaminants in groundwater during outdoor use are via incidental ingestion and dermal contact during gardening, lawn care, and other nonpotable uses. Off-site child residents could be exposed to contaminants in groundwater used to fill an outdoor swimming/wading pool.

Two groundwater aquifers are present in the vicinity of the site, with a continuous clay layer separating the two systems (Warzyn, Inc. 1991a). In the site monitoring wells, the average depth to the top of the clay confining layer is about 15 to 20 feet bgs. A thorough survey of private wells in the area performed by Warzyn (now Montgomery Watson) during the Remedial Investigation (Warzyn, Inc. 1991a) indicated that all private wells in the vicinity of the site (on Reder Rd., Colfax Ave., and Arbogast St.) are screened in the lower aquifer, at depths ranging from 45 to 65 feet bgs. The majority of the logs provide descriptions of the formations at the well location, and document the presence of the clay layer and that the well is screened below the clay layer. Well records were not available for two wells in Area 5A, along Reder Road. However, contaminant concentrations collected from these two private

wells (and all of the other private wells) are significantly lower than concentrations measured in the upper aquifer in that area, and are similar to those measured in the lower aquifer. Thus, there is no evidence that any private wells are currently screened above the clay layer in Areas 5A or 5B, or are being influenced by groundwater quality in the upper aquifer (ENVIRON 1998).

Therefore, the risk assessment uses concentrations in the lower aquifer to estimate current and future potable residential uses in Area 5A. However, as a bounding scenario, the risk assessment also evaluates potential risks from residential non-potable use (i.e., lawncare, wading pool, etc.) of upper aquifer water.

### **3.2.7 Area 5B: Off-site North**

Area 5B consists of off-site properties to the north of the site that are zoned for industrial use. The area immediately north of the site in Area 5B is primarily vacant, and classified as wetlands. There are no residences in Area 5B within approximately half a mile of the site, and the wetlands portion of Area 5B is unlikely to be developed in any way due to Federal Clean Water Act prohibitions on wetland development (42 U.S.C. 1311 and 1344). Future potential receptors in the non-wetlands portions of Area 5B are off-site commercial workers. Contaminants have been detected in upper aquifer water in a vacant portion of this area, so exposures are evaluated for those future construction workers who may potentially contact upper aquifer water. The clay layer averages 13 feet in depth below ground surface in Area 5B, which precludes installation of a well in the upper aquifer. Thus, workers performing excavation for construction are the only receptors likely to contact upper aquifer water.

To conservatively estimate future exposures to the upper aquifer in Area 5B, it is assumed that excavations could occur anywhere in Area 5B. Due to the shallow depth to groundwater in Area 5B, exposure to groundwater in an excavation pit may occur.

The baseline risk assessment evaluates potential future exposures by construction workers, assuming that protective equipment may not be worn during excavation activities. In such cases, the primary potential routes of exposure for excavation workers would be dermal contact with groundwater entering into an excavation pit and inhalation of vapor from exposed groundwater.

Northern migration of on-site contaminants in the lower aquifer could potentially occur and contaminate the lower aquifer below Area 5B in the future. This future lower aquifer could then be put to various commercial uses. In order to account for this potential migration and exposure, current on-site concentrations in the lower aquifer were used to assess future inhalation and dermal exposures to commercial workers (e.g., car wash) in Area 5B.

### **3.2.8 Area 6: Off-site - West**

Area 6 consists of off-site properties to the west and southwest of the site in an area that is zoned for residential use. Current and future potential receptors in Area 6 include off-site residents and off-site workers. As off-site worker exposures are expected to be lower than potential residential exposures in Area 6, only residential exposures are quantified in the risk assessment. Risks are calculated for both child and adult residents. Surface water from Area 4A (i.e., the wetlands area) discharges contaminated sediment to a low-lying area between the Chesapeake and Ohio railroad right-of-way and the Griffith Municipal landfill. Water intermittently present in this area flows to the west, towards Area 6. Therefore, potential residential exposures to sediment are evaluated for Area 6. Exposures to groundwater are not evaluated, however, because Area 6 is not located downgradient of the site.

## **3.3 Exposure Concentrations**

Contaminant concentrations have been measured in soil, groundwater, surface water, and sediment at various locations at and around the ACS site. The sampling locations for all environmental samples used in this assessment are presented in Figure 3-3 (soil and sediment) and Figure 3-4 (surface water and groundwater). The measured contaminant concentrations in each media are used in estimating potential exposure concentrations; i.e., chemical concentrations at the potential points of contact discussed in Section 3.2. The approaches used to estimate exposure concentrations in the various environmental media (i.e., soil, groundwater, surface water, sediment, and ambient air) are presented in the following sections. The tables presenting the exposure point concentrations for soil (Tables 2-9-1 through 2-9-9), sediment (Tables 2-10-1 through 2-10-5), surface water (Tables 2-11-1 through 2-11-4), and groundwater (Tables 2-12-1 through 2-12-7) follow the text.

### **3.3.1 Exposure Concentrations in Soil**

USEPA guidance (USEPA 1989, 1992d) recommends using a conservative estimate of the arithmetic mean of measured concentrations for the exposure point concentration, when evaluating long-term exposures. The 95% upper confidence limit (UCL) on the arithmetic mean of measured concentrations is used in calculating chronic daily intake (CDI), although the maximum measured concentration is used when the 95% UCL exceeds the maximum detected concentration (USEPA 1989). With the exception of Area 2 and Area 3, the 95% UCL was calculated for all data sets where the number of samples was greater than 10. At the request of USEPA, a 95% UCL for Areas 2 and 3 was not calculated, and the maximum concentration detected was used as the exposure point concentration (USEPA 1998e). In

calculating the 95% UCL, assumptions about the distribution of the concentration data are necessary. In the baseline risk assessment, 95% UCL concentrations are calculated using the USEPA default equation for lognormally distributed data, the most common distribution for complete environmental data sets (USEPA 1992d).

For evaluating potential surface contact exposures, the lower of the 95% UCL and maximum detected concentration of a contaminant is obtained using soil samples collected from 0 to 2 feet below ground surface for current scenarios, and from 0 to 10 feet for the future scenarios. For evaluating potential exposures during utility excavation activities, the lower of the 95% UCL and maximum detected concentration of a contaminant is obtained using soil samples collected from a depth of 0 to 10 feet for the current and future scenarios, except in Areas 2, 3, and 4B. As mentioned previously, at USEPA's request, the maximum concentration was used as the exposure point for Areas 2 and 3. No wastes were disposed of in Area 4B, and no contaminants were detected in the subsurface soil sample from this Area (SB-096). Therefore, in Area 4B, the lower of the 95% UCL and maximum detected concentrations for all samples collected within a depth of two feet was used to evaluate potential future exposures during utility maintenance.

Subsurface soil sampling was very limited in Areas 2 and 3. However, from this limited data, it is known that the contamination in these two areas is heterogeneous, both in nature and distribution. Because of the limited data and at USEPA's request, the risk of soil exposures in these areas is based upon maximum concentrations. In order to more reasonably estimate the risk associated with these areas, further investigation would be required.

**3.3.1.1 Exposure Concentrations in Soil for Utility Maintenance and Construction Scenarios.** As discussed in Section 3.2, workers may contact soils extending from the ground surface to the bottom of an excavation during excavation activities for utility maintenance or construction. For utility maintenance in Areas 1, 2, 3, and 4B, excavations are assumed to extend to 10 feet below ground surface. For hypothetical future building construction in Areas 2 and 3, two excavation depths are evaluated: (1) 4 feet below ground surface, and (2) 10 feet below ground surface. Neither utility maintenance nor building construction scenarios are evaluated for Area 4A because it is a wetland. Only slab-on-grade construction scenarios are evaluated for Area 1 and Area 4B because of the shallow depth to groundwater in these areas.

#### **Area 1**

**Surface Samples (0-2'):** 14 samples, used to evaluate current routine worker

**Subsurface Samples (0-4'):** 28 samples, used to evaluate future construction worker



**Subsurface Samples (0-10'):** 86 samples, used to evaluate current and future utility worker, future routine worker, and future trespasser

For all chemicals detected at least once within the specified depth ranges (i.e.: 2 ft bgs, 4 ft bgs, or 10 ft bgs), the concentration in non-detect samples was assumed equal to one-half the detection limit for that sample. Chemicals not detected within a depth range were not included in the analysis for the corresponding scenario. The lower of the 95% UCL and maximum detected concentration for each chemical was used as the exposure point concentration.

## **Area 2**

**Surface Samples (0-2'):** none

**Subsurface Samples (2-4'):** 12 samples, used to evaluate current trespassers and future construction worker (slab on grade)

**Subsurface Samples (2-10'):** 28 samples, used to evaluate current and future utility worker, future routine worker, future trespasser, and future construction worker

For Area 2, because there are no surface soil data, the subsurface soil concentrations were used to characterize the risks. This assumption is believed to be conservative because it does not account for the lower concentrations expected to be present in the clay cap placed over Area 2 wastes in the 1970's, and in the additional one-foot clay cap installed during recent remediation activities to limit surface water infiltration. For all chemicals detected at least once within the specified depth range (4 ft bgs or 10 ft bgs), the concentration in non-detect samples was assumed to be equal to one-half the detection limit for that sample. Chemicals not detected within the specified depth were not included in the analysis for the corresponding scenario. For each depth range, as requested by the USEPA, the maximum concentration was used as the exposure concentration.

## **Area 3**

**Surface Samples (0-2'):** 14 samples, used to evaluate current trespassers

**Subsurface Samples (0-4'):** 20 samples, used to evaluate future construction worker (slab on grade)

**Subsurface Samples (0-10'):** 44 samples, used to evaluate current and future utility workers, future routine worker, future trespasser, and future construction worker.

For all chemicals detected at least once within the specified depths, the concentration in non-detect samples was assumed to be equal to one-half the detection limit for that sample. Chemicals not detected within the specified depth were not included in the analysis for the

corresponding scenario. As in area 2, for each depth range, the maximum concentration was used as the exposure concentration.

#### **Area 4B**

**Surface Sediment Samples (0-2'):** 6 samples, used to evaluate current trespasser

Surface sediment concentrations were assumed to characterize the concentrations throughout an excavation in Area 4B. This assumption is conservative since no waste disposal occurred in this area, and no chemicals were detected in the soil boring sample collected at depth. For each chemical, the exposure concentration was assumed to be the 95% UCL on the arithmetic mean, or the maximum concentration, whichever was lower for the surface sediments.

#### ***3.3.2 Exposure Concentrations in Groundwater***

As discussed in Section 3.2, workers are not currently exposed to on-site groundwater. However, within the last ten years, lower aquifer production wells were used in Area 1. Therefore, in order to reinforce the need for deed restrictions against the use of onsite groundwater, it is conservatively assumed that current workers are exposed to groundwater in Area 1 through ingestion and dermal contact and inhalation of volatile organic compounds (VOCs) while showering. In the future, on-site routine worker exposure to contaminants in lower aquifer groundwater would occur if on-site groundwater wells in Areas 1, 2, 3, and 4B are established to supplement the available municipal supply. Exposure could once again occur via ingestion, dermal contact while showering, and inhalation of VOCs. Potential exposure concentrations for Areas 1, 2, 3, and 4B are conservatively estimated using the maximum detected concentration for each contaminant in lower aquifer water, based on all production wells and on-site lower aquifer monitoring well data.

In addition, future worker exposure to contaminants in upper aquifer groundwater may occur through dermal contact with and inhalation of vapors emitted from exposed groundwater during utility excavation and construction activities in Areas 1, 4B, and 5B, where the depth to groundwater is shallowest. In other areas, the groundwater is considerably deeper and direct exposures would not be expected. The exposure concentrations in Areas 1 and 4B are estimated using the maximum detected concentrations for each contaminant in groundwater, based on data from the upper aquifer monitoring wells located in or immediately adjacent to each area.

Consistent with USEPA Region 5 policy, potential future worker exposures (i.e., construction worker) to contaminants in off-site upper aquifer water in Area 5B are estimated using data from wells at the center of the plume. Of the four upper aquifer wells in Area 5B,

only Well MW-48 is in the center of the plume. In addition to future use of the shallow aquifer, the lower aquifer in Area 5B could be used for future commercial/industrial uses. The primary direction of groundwater flow in this area is generally to the north, and thus the current on-site contaminant plume could potentially move into Area 5B. In order to conservatively account for the potential future off-site commercial/industrial risk of exposure to the on-site lower aquifer contamination, current on-site contaminant-specific maximums were used as the exposure point concentrations for Area 5B. The commercial use of the lower aquifer in Area 5B that is evaluated in this risk assessment is that of a labor-intensive, auto-detailing car wash facility. This type of facility would produce a water aerosol which would presumably represent full-body dermal exposure for the workers and inhalation of vapors during their entire work day.

As discussed in Section 3.2.6, off-site residential exposure to contaminants in groundwater may occur in Area 5A through ingestion, dermal contact, and inhalation of vapors during household use and through incidental ingestion and dermal contact during outdoor activities (i.e., gardening, swimming, etc.). Potential current exposures to contaminants in groundwater are estimated using data from existing private wells. The existing private well with contaminant concentrations corresponding to the highest overall potential risk is conservatively used to evaluate current off-site residential exposures. Potential future exposures to contaminants in lower aquifer water are estimated using the maximum concentration for each contaminant detected in any off-site well in Area 5A. This approach is considered conservative because the maximum concentrations for all contaminants do not all occur in the same well.

As discussed in Section 3.2, the shallow depth of the clay layer in the vicinity of the site and other factors are expected to preclude installation of wells into the upper aquifer (ENVIRON 1998). However, as a bounding estimate, future residential exposures to upper aquifer water are evaluated for outdoor exposure activities only. Consistent with USEPA Region 5 policy, potential future exposures to contaminants in upper aquifer water are estimated using the lower of the 95% UCL and maximum detected concentration data from wells at the center of the off-site plume (i.e., Wells MW-45 and MW-06 in Area 5A).

### ***3.3.3 Exposure Concentrations in Sediment and Surface Water***

Exposures of trespassers to sediments and surface water in Area 4A and 4B, and of residents to sediments in Area 6, are evaluated under both current and future scenarios. Exposures of trespassers to these media in Areas 1 and 2 are also evaluated under the future scenario. Exposures of workers to sediments and surface water in Area 1 are evaluated under both current and future scenarios, while exposures to these media in Area 2 and 4B are

evaluated only under future scenarios since Areas 2 and 4B are not currently developed. In each of these areas, exposure concentrations are based on the lower of the 95% UCL and the maximum detected connection.

### **3.3.4 Exposure Concentrations in Air**

Exposure concentrations in ambient air resulting from potential vapor and particulate emissions from soil, and from potential vapor emissions from groundwater and surface water, are estimated using mathematical models in combination with the exposure concentrations in soil, groundwater, and surface water. The vapor and particulate emission models for unsaturated soil, the vapor emission model for exposed and covered groundwater, and the air dispersion model for estimating on-source and off-source air concentrations are all recommended by USEPA (USEPA 1992, 1996a). Major features and input assumptions in the emission and dispersion modeling and all calculations were performed by Environ (ENVIRON 1998). The outputs of the air modeling are included in their entirety in the Environ RA (ENVIRON 1998).

Environ's air emission concentrations resulting from contaminated surface water, soil, and groundwater were used in this risk assessment. Because Environ calculated air emissions from soil for two depth ranges (0 to 2 feet and 2 to 10 feet), in some scenarios, these values were combined to determine a depth weighted average.

The model used to estimate vapor emissions from unsaturated soil is described by Jury et al. (1990) and by USEPA in its *Soil Screening Guidance* (USEPA 1996a). The model estimates the average vapor flux from the soil surface over a defined period of exposure under steady-state conditions, with the assumption that contaminants in soil extend to a finite depth (i.e., to the water table) and that no clean cover is present. Default values recommended by USEPA (1996a) are used for all soil properties, unless site-specific data are available. Chemical-specific transport properties (i.e.,  $K_{oc}$ , Henry's law constant, diffusivity in air, and diffusivity in water) compiled by USEPA (1996a) are also used in the calculation of vapor flux.

The model used for estimating potential vapor emissions from exposed groundwater and surface water is recommended by USEPA (1992e). It estimates the steady-state vapor flux of contaminants using an overall mass transfer coefficient, which accounts for mass transfer of a chemical through water-air interfacial films. The concentration of a contaminant in the exposed groundwater is assumed to remain constant at the estimated exposure concentration. Henry's law constants compiled by USEPA (1996a) are used in the calculation of the overall mass transfer coefficients.

The model for estimating vapor emissions from groundwater below a layer of cover soil is a one-dimensional steady-state diffusion model using Fick's Law. The model estimates the steady-state vapor flux of contaminants from the water table, through the region of capillary rise, and through pore space in soil above the capillary fringe. The concentration of a contaminant in the groundwater is assumed to remain constant at the estimated exposure concentration. Henry's law constants and diffusion coefficients compiled by USEPA (1996a) are used in the calculations.

The particulate emission model (USEPA 1992e) for undisturbed soils is based on the suspension of surface soil by wind erosion. It estimates the emission of respirable soil particles, defined as being 10  $\mu\text{m}$  in diameter or smaller (i.e.,  $\text{PM}_{10}$ ). The key parameters in the model that influence particulate emission are the threshold friction velocity for the soil and the mean annual wind speed. For the threshold friction velocity, which is correlated to the mode of the soil aggregate size distribution, USEPA's default mode aggregate size of 0.5 mm is used. A mean annual wind speed of 10.2 miles per hour (or 4.56 m/s) from the National Oceanic and Atmospheric Administration (NOAA 1993) for South Bend, Indiana is used. USEPA (1996a) default values are used for other model parameters, unless site-specific data are available.

Particulate emissions resulting from potential on-facility excavation in Areas 1 and 4B are expected to be insignificant since the water table in these areas is very shallow. Therefore, little dry soil would be exposed to become susceptible to airborne transport. Particulate emissions during hypothetical future excavations and construction in Areas 2 and 3 are evaluated using empirical data compiled by USEPA (1995b) which pertain to dust emission from "heavy construction operations."

Under non-excavation conditions, on-facility and off-site air concentrations are estimated using USEPA's Industrial Source Complex (ISCST3) model (USEPA 1995a). ISCST3 is an advanced steady-state Gaussian plume model that calculates chemical concentrations at specific downwind locations as a function of wind speed, atmospheric stability, temperature gradient, mixing height, and downwind distance. ISCST3 utilizes local hourly meteorological data records to define the conditions for dispersion. Data from the closest stations were used: Michiana Airport in South Bend, Indiana for surface meteorological conditions, and Bishop Airport in Flint, Michigan for upper air data. The on-site workers in each area are assumed to move freely throughout the area, and the applicable area-wide dispersion factor is estimated from the average of the dispersion factors developed for each receptor location within the area.

Other major assumptions used in the modeling are (ENVIRON 1998):

- The emission source is represented as a non-buoyant, zero-momentum area source;

- Suspended particles from the source remain suspended before reaching the receptor (i.e., there is negligible deposition and resuspension); and
- The physical setting of the facility and its immediate surroundings can be modeled as a rural environment with no significant obstructions (e.g., tall buildings, abrupt topography).

For excavation activities, on-site concentrations in air are estimated using a simple "box" model, while off-site concentrations are estimated using USEPA's ISCST3 model. The "box" model allows for screening level calculations near a ground level emission source (ENVIRON 1998).

Results of air emission and dispersion modeling were compared to ambient air monitoring conducted at the site in July 1997 (Focus 1997). Daily eight-hour ambient air samples were collected approximately 100 feet upwind and 100 feet downwind of the material handling activities in Area 2 during on-site excavation, trenching, and screening. Modeled emissions were estimated using: (1) maximum soil concentrations in Area 2; and (2) the lower of the maximum and 95% UCL soil concentrations in Area 2. These emissions were combined with maximum eight-hour average dispersion estimates for receptors located approximately 100 feet from a source, based on ISCST3. Modeled ambient air concentrations based on maximum Area 2 soil concentrations ranged from five-fold to 200-fold higher than the maximum measured ambient air concentrations. Modeled ambient air concentrations based on the lower of the maximum or 95% UCL soil concentrations more closely approximated the measured concentrations (i.e., modeled concentrations ranged from 0.9 to 30 times the measured concentrations). Thus, ambient air concentrations estimated in Environ's RA and utilized in this risk assessment are likely to be conservative estimates of potential concentrations based as they are on USEPA's emission models and the ISCST3 dispersion model (ENVIRON 1998).

Indoor air concentrations for indoor use of groundwater are estimated by applying a volatilization factor of 0.5 L/m<sup>3</sup> to the estimated concentrations of volatile organic compounds in groundwater. The volatilization factor is based on experimental data on the volatilization of radon from household uses of water and is recommended by USEPA (1991c). The volatilization factor is also consistent with the results of three-compartment, mass balance models (McKone 1987) simulating the transfer of VOCs from household uses of tap water and the distribution of the VOCs inside a home. The volatilization factor of 0.5 L/m<sup>3</sup> was also used to estimate air concentrations in on-site showers used by workers.

### 3.4 Estimation of Media Intake

Potential exposures via the pathways identified in Section 3.2 are calculated by multiplying the estimated contaminant concentrations in environmental media (identified in Section 3.3) by the estimated intake of the environmental media by potentially exposed populations (human intake factor). The product of these two components is called the daily intake (USEPA 1992c). The daily intake is combined with toxicity values (presented in Section 4) to estimate theoretical carcinogenic risk and the potential for noncancer health hazards (presented in Section 5).

Intake is calculated differently when evaluating theoretical carcinogenic risk than when evaluating the potential for noncarcinogenic effects. For evaluating carcinogenic risk, intake is averaged over a lifetime (USEPA 1989) and is called the chronic daily intake (CDI). For evaluating noncarcinogenic effects, intake is averaged over the period of exposure and is called the daily intake (DI). The CDI and DI of a contaminant for a specific route of exposure (e.g., soil ingestion) are generally calculated using the following equations:

The general equation for estimating the human intake factor is as follows:

$$\text{Human Intake Factor (HIF)} = \frac{CR \cdot EF \cdot ED}{BW \cdot AT} \quad \text{Equation (5)}$$

$$\text{Chronic Daily Intake} = \text{Concentration}_{\text{medium}} \cdot \text{Human Intake Factor}_{\text{lifetime, route}} \quad \text{Equation (4)}$$

where:

- |     |   |   |
|-----|---|---|
| HIF | = | Unit dose, kg <sub>soil</sub> /kg <sub>body weight</sub> -day   |
| CR  | = | contact rate, which is either: <ul style="list-style-type: none"> <li>- soil ingestion rate, mg/day</li> <li>- drinking water rate, L/day;</li> <li>- dermal contact rate for soil exposures, mg/day, which is the product of the exposed skin surface area (SA), soil-to-skin adherence factor (AF), and absorption factor (ABS);</li> <li>- dermal contact rate for water exposures, cm<sup>3</sup>/day, which is the product of the skin surface area (SA), skin permeability coefficient (K<sub>p</sub>), and exposure time.</li> </ul> |
| EF  | = | exposure frequency, days/year, which includes an exposure time (ET) term for the inhalation pathway;  |
| BW  | = | body weight, kg; and  |
| ED  | = | exposure duration, years;   |

AT = averaging time (AT) days, which is a lifetime of 70 years for carcinogens ( $AT_{\text{carc}}$ ), and which is equal to the exposure duration for noncarcinogens ( $AT_{\text{noncarc}}$ ).

It should be noted that for dermal contact, EF is expressed as events/day and ET is expressed in minutes/event or hours/event.

The factor values (e.g., ED, EF, etc.) and specific equations used to calculate media intakes for every route of exposure evaluated in this risk assessment are presented in the exposure factors tables (Tables 3-9 through 3-57). Estimates of media intake are developed for the following potential populations (receptors) and exposure scenarios, as identified in Section 3.2:

#### **3.4.1 On-site Routine Worker (Areas 1, 2, 3, 4B)**

- incidental soil/sediment ingestion
- dermal contact with soil/sediment
- inhalation of vapors and particulates in ambient air
- ingestion of groundwater indoors
- dermal contact with groundwater indoors
- inhalation of vapors from indoor groundwater use
- incidental ingestion of surface water outdoors (Areas 1, 2, 4B only)
- dermal contact with surface water outdoors

#### **3.4.2 On-site Utility Worker (Areas 1, 2, 3, 4B)**

- incidental soil/sediment ingestion
- dermal contact with soil/sediment
- inhalation of vapors and particulates in ambient air
- dermal contact with groundwater while excavating (Areas 1 and 4B only)
- inhalation of vapors from groundwater outdoors (Areas 1 and 4B only)
- ingestion of groundwater used indoors
- dermal contact with groundwater indoors
- inhalation of vapors from indoor groundwater use

#### **3.4.3 On-site Construction Worker (Areas 1, 2, 3, 4B)**

- incidental soil ingestion
- dermal contact with soil
- inhalation of vapors and particulates in ambient air



- dermal contact with groundwater while excavating (Areas 1 and 4B only)
- inhalation of vapors from groundwater outdoors (Areas 1 and 4B only)

#### **3.4.4 On-site Trespasser (Areas 1, 2, 3, 4A, 4B)**

- incidental ingestion of soil and/or sediment
- dermal contact with soil and/or sediment
- inhalation of vapors and particulates in ambient air
- incidental ingestion of surface water (Areas 1, 2, 4A, 4B only)
- dermal contact with surface water (Areas 1, 2, 4A, 4B only)
- inhalation of vapors emitted from surface water (Area 4A only)

#### **3.4.5 Off-site Resident (Areas 5A and 6)**

- incidental ingestion of soil (Area 5A only)
- dermal contact with soil (Area 5A only)
- incidental ingestion of sediment (Area 6 only)
- dermal contact with sediment (Area 6 only)
- inhalation of vapors and particulates in ambient air
- incidental ingestion of groundwater used outdoors (Area 5A only)
- dermal contact with groundwater used outdoors (Area 5A only)
- ingestion of groundwater used indoors (Area 5A only)
- dermal contact with groundwater while showering (Area 5A only)
- inhalation of vapors from household use of groundwater (Area 5A only)

#### **3.4.6 Off-site Construction Worker (Area 5B)**

- inhalation of vapors in ambient air
- dermal contact with groundwater while excavating

#### **3.4.7 Off-site Commercial Worker (Area 5B)**

- inhalation of vapors in ambient air
- dermal contact with groundwater (i.e., car wash)

According to USEPA (1995c) guidance, variability in the factors affecting exposure within a potentially exposed population should be considered in estimating potential current and future exposures. As one means of characterizing the distribution of possible exposures in a population, USEPA (1995c) recommends that both reasonable maximum exposure (RME)

and central tendency estimates of exposure be developed. Central tendency estimates represent the average exposures in the population. RME estimates represent the exposures "above the 90th percentile of the population distribution, but not higher than the individual in the population who has the [maximum] exposure." (USEPA 1995c). The exposure factors for estimating central tendency and RME intakes and intake equations for each of the potential receptor groups are presented in the following sections and summarized in Tables 3-9 through 3-57, respectively. The factors discussed below apply to both current and future land use scenarios, unless otherwise noted.

### **3.4.8 On-site Routine Worker**

The exposure factors used in the baseline risk assessment for workers engaged in routine industrial activities at the site are discussed below:

#### **3.4.8.1 Contact Rates.**

- **Incidental Ingestion Rate of Surface Soil/Sediment**

The current and future routine worker is assumed to ingest 100 mg of soil/sediment per day under the RME scenario, and 50 mg of soil/sediment per day under the central tendency (CT) scenario. Consistent with USEPA guidance (1991a, 1997c), these ingestion rates are based on the adult soil ingestion rates presented in Calabrese et al. (1990).

The routine worker is expected to primarily be exposed to surface soil in Areas 1, 2, and 3. Occasionally, the current routine worker could contact sediment in the fire pond in Area 1, and future routine workers could contact sediment in ditches in Area 2 and Area 4B. It is assumed that the worker would be in contact with sediment for up to an hour per day and the remainder of the eight-hour day would be in contact with soil. Since the total soil/sediment ingestion rate for the RME scenario is 100 mg/day, it is assumed that the ingestion rate of soil and sediment in Areas 1 and 2 would be 87.5 mg/day and 12.5 mg/day, respectively. Accordingly, it is assumed that the ingestion rate of soil and sediment in Areas 1 and 2 would be 43.75 mg/day and 6.25 mg/day, respectively, for the CT scenario. Since there is no sediment evaluated in Area 3 and no soil evaluated in Area 4B, the soil/sediment ingestion rate in these area is 100 mg per day under the RME scenario and 50 mg per day under the CT scenario.

- **Dermal Contact with Surface Soil/Sediment: Exposed Skin Surface Area, Soil-Skin Adherence Factor, and Absorption Factor**

Dermal contact is estimated from the product of exposed skin surface area, soil-skin adherence factor, and chemical-specific absorption factor. The product of the exposed skin surface area and the soil-skin adherence factor is known as the dermal soil loading.

Based on USEPA (1992f), soil adherence is assumed to be 1.0 mg/cm<sup>2</sup>-event for RME scenario and 0.2 mg/cm<sup>2</sup>-event for the CT scenario. USEPA (1992f) recommends assuming that a skin area corresponding to 25% of the total body skin area is exposed to soil. Accordingly, surface area is assumed to be 5,800 cm<sup>2</sup> (95<sup>th</sup> percentile of total body surface area for adult workers) for the RME scenario and 5,000 cm<sup>2</sup> (50<sup>th</sup> percentile of total body surface area for adult workers) for the CT scenario.

USEPA's (1998d) chemical-specific absorption factors (e.g., cadmium and PCB's) are used in this assessment. The generic absorption factors recommended in USEPA (1998b) guidance of 10% for organics and 1% for inorganics are used for all other chemicals lacking chemical-specific factors.

- **Incidental Ingestion Rate of Surface Water**

Current and future routine workers in Area 1 could contact surface water in the fire pond, and future workers could contact surface water that is intermittently present in ditches in Area 2 and Area 4B. Under the RME and CT scenarios, the routine worker is assumed to incidentally ingest 0.05 liters of surface water per contact event. This ingestion rate is conservatively based on USEPA's (1989) ingestion rate for swimming of 0.05 L/hour, along with the assumption that the worker would be in contact with the water for up to an hour per day for both the RME and CT scenarios. The ingestion rate is conservative, considering that the worker is not swimming in the water, and thus the potential for incidental ingestion is lower (ENVIRON 1998).

- **Dermal Contact with Surface Water: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

Dermal contact with contaminants in water is estimated from the product of the exposed skin surface area and the chemical-specific dermal permeability coefficient ( $K_p$ ). Consistent with exposed skin surface areas for soil exposure, the future routine worker is assumed to have 5,800 cm<sup>2</sup> of exposed skin for the RME scenario and 5,000 cm<sup>2</sup> of exposed skin for the CT scenario of exposure to either surface water or groundwater used outdoors. It is conservatively assumed that the entire exposed skin surface area would come into direct contact with water (ENVIRON 1998).

Chemical-specific permeability coefficients ( $K_p$ ) were estimated using Equation 5.8 from USEPA (1992f), while a default  $K_p$  value of  $10^{-3}$  cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established, based on USEPA (1992f) which states that the limiting permeability coefficient in the viable epidermis ranges from 0.1 to 1.0 cm/hr and that "...it seems reasonable to expect that experimentally measured permeability coefficients for chemical penetration across the skin from aqueous media (assuming that the chemical does not alter the barrier properties) are limited to one cm/hour".

As described above for incidental ingestion of surface water, the future routine worker is assumed to be in contact with surface water for one hour per day under both the high end and CT scenarios.

- **Ingestion Rate of Groundwater Used Indoors**

For current and future worker scenarios, it is assumed that on-site wells installed in the lower aquifer could be used. The ingestion rate for this indoor use is USEPA's default for workers of 1 L/day for CT and 1.4 L/day for RME scenarios (USEPA 1993a).

- **Dermal Contact with Groundwater Used Indoors: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

For current and future scenarios, it is assumed that workers could use the water for showering, thereby exposing the total body surface area to groundwater. The RME surface area is assumed to be 23,000 cm<sup>2</sup> corresponding to the 95th percentile of measured total body surface areas for men (USEPA 1992f, 1997c). The central tendency surface area is assumed to be 20,000 cm<sup>2</sup>, based on the mean total body surface areas for men (USEPA 1992f, 1997c).

$K_p$  values were estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of  $10^{-3}$  cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

The RME exposure time is 20 minutes per shower and the CT exposure time is 10 minutes per shower (EPA, 1997c).

- **Inhalation Rate of Groundwater Used Indoors**

For current and future worker scenarios, it is assumed that on-site wells installed in the lower aquifer could be used. The inhalation rate for this indoor use is USEPA's default for workers of 20 cubic meters (m<sup>3</sup>)/day.

### **3.4.8.2 Exposure Frequency.**

- **Frequency of Incidental Ingestion of Soil and Indoor Dust**

Under RME scenario, the routine worker is expected to have an exposure frequency of 250 days/year, based on a 5-day work week for 50 weeks per year, consistent with USEPA (1991a) guidance. Under the CT scenario, the routine worker is expected to have an exposure frequency of 219 days/year, based on an average for all full and part-time workers (USEPA 1993a). These frequencies account for both outdoor ingestion of surface soil and indoor ingestion of dust.

- **Frequency of Dermal Contact with Soil and Indoor Dust**

For routine workers, the frequency of dermal contact is assumed to be the same as the frequency of incidental ingestion. Thus, the exposure frequency is 250 days per year for the RME scenario and 219 days/year for the CT scenario, accounting for both outdoor contact with surface soil and indoor contact with dust.

- **Frequency of Inhalation of Vapor and Particulates in Ambient Air, including Exposure Time (ET) Term**

Under the RME scenario, the routine worker is expected to have an inhalation exposure frequency of 250 days/year, based on 5-day work week for 50 weeks per year, consistent with USEPA (1991a) guidance. As discussed above, under the CT scenario, workers are expected to have an inhalation exposure frequency of 219 days per year. Because of the high activity level expected for a worker, and therefore elevated inhalation rate, the exposure frequency is not adjusted by an exposure time (ET) term to account for the hours per day a receptor is at the site. Thus, the inhalation rate for the worker would correspond to 2.5 m<sup>3</sup>/hr (i.e., 8 hour work day generates the default inhalation rate of 20 m<sup>3</sup>/day).

- **Frequency of Incidental Ingestion of Surface Water**

Current and future workers in Area 1 could contact surface water in the fire pond, and future workers could contact surface water that is intermittently present in ditches in Area 2 and Area 4B. Under the RME scenario, the routine worker is assumed to incidentally ingest surface water approximately once a week during the summer months, or 12 days per year. Under the CT scenario, the routine worker is assumed to incidentally ingest surface water once a month during the summer months, or three days per year.

- **Frequency of Dermal Contact with Surface Water**

Frequency of dermal contact with surface water is expected to be the same as the frequency of incidental ingestion of surface water. Thus, the exposure frequency for

a worker is 12 days per year for the RME scenario and three days per year for the CT scenario.

- **Frequency of Ingestion of Groundwater Used Indoors**

It is assumed that current and future workers would ingest the water each work day. Thus, the exposure frequency for ingestion of water is 250 days per year under the RME scenario and 219 days per year for the CT scenario.

- **Frequency of Dermal Contact with Groundwater Used Indoors**

It is assumed that current and future workers could use the water for showering during each work day. Thus, the exposure frequency for dermal contact is 250 days per year for the RME scenario and 219 days per year for the CT scenario.

- **Frequency of Inhalation of Vapors from Groundwater During Indoor Use**

It is assumed that current and future workers could use the water for showering during each work day. Thus, the exposure frequency for inhalation exposures is 250 days per year for the RME scenario and 219 days per year for the CT scenario.

**3.4.8.3 Exposure Duration.** For the RME scenario, the routine worker is expected to work at the facility for 25 years, based on the standard default for worker tenure at one location (USEPA 1991a). For the CT scenario, the routine worker is expected to work at the facility for 5 years, based on the recommended central tendency value for worker tenure at one location (USEPA 1993a).

**3.4.8.4 Body Weight.** For both the RME and CT scenarios, the body weight of the routine worker is assumed to be 70 kg, based on the mean adult body weight presented in USEPA (1993a, 1997c).

**3.4.8.5 Averaging Times.** For both the RME and CT scenarios, the averaging time for carcinogenic risks is equal to a lifetime of 70 years in days (i.e., 25,550 days). For both the RME and CT scenarios, the averaging time for noncarcinogenic effects is equal to the exposure duration in days. For year-round exposures, such as soil ingestion, the averaging time is equal to the number of days in a year multiplied by the number of years of exposure. For seasonal exposures, such as dermal contact with surface water, the averaging time is equal to the number of days in the season multiplied by the number of years of exposure. For example, the RME scenario averaging time for a worker contacting surface water is calculated:  $(3 \text{ months}/12 \text{ months}) \times (365 \text{ days/yr}) \times (25 \text{ years})$ , which equals 1,825 days.

### **3.4.9 On-site Utility Worker**

The exposure factors discussed below correspond to a potential current and future scenario in which workers engage in excavation activities in order to maintain underground utility lines without wearing the personal protective equipment currently required by ACS health and safety protocols.

#### **3.4.9.1 Contact Rates.**

- **Incidental Ingestion Rate of Surface and Subsurface Soil (Areas 1, 2, and 3)**

For the RME scenario, the utility worker is assumed to ingest 100 mg of soil for 240 days per year and 480 mg of soil for 10 days per year, based on USEPA (1991a, 1993a). Under the CT scenario, the utility worker is assumed to ingest 50 mg of soil for 214 days per year and 100 mg of soil for 5 days per year, based on USEPA (1993a).

- **Dermal Contact with Surface and Subsurface Soil: Exposed Skin Surface Area, Soil-Skin Adherence Factor, and Absorption Factor (Areas 1, 2, and 3)**

Dermal contact with soil is estimated from the product of the exposed skin surface area, the soil-skin adherence factor, and the chemical-specific absorption factor. The product of the exposed skin surface area and the soil-skin adherence factor is known as the dermal soil loading.

Based on USEPA (1992f), soil adherence is assumed to be 1.0 mg/cm<sup>2</sup>-event for the RME scenario and 0.2 mg/cm<sup>2</sup>-event for the CT scenario. USEPA (1992f) recommends assuming that a skin area corresponding to 25% of the total body skin area is exposed to soil. Accordingly, surface area is assumed to be 5,800 cm<sup>2</sup> for the RME scenario and 5,000 cm<sup>2</sup> for the CT scenario.

The estimates for absorption factors for the utility workers are assumed to be the same as those for the routine worker (as described in Section 3.4.8.1).

- **Incidental Ingestion Rate of Sediment (Area 4B only)**

For the RME scenario, the utility worker is assumed to ingest 100 mg of sediment for 240 days per year and 480 mg of sediment for 10 days per year, based on USEPA (1991a, 1993a). Under the CT scenario, the utility worker is assumed to ingest 50 mg of soil for 214 days per year and 100 mg of soil for 5 days per year, based on USEPA (1993a).

- **Dermal Contact with Sediment: Exposed Skin Surface Area, Soil-Skin Adherence Factor, and Absorption Factor (Area 4B only)**

Dermal contact with sediment is estimated from the product of the exposed skin surface area, the soil-skin adherence factor, and the chemical-specific absorption factor. The product of the exposed skin surface area and the soil-skin adherence factor is known as the dermal soil loading.

Based on USEPA (1992f), soil adherence is assumed to be 1.0 mg/cm<sup>2</sup>-event for the RME scenario and 0.2 mg/cm<sup>2</sup>-event for the CT scenario. USEPA (1992f) recommends assuming that a skin area corresponding to 25% of the total body skin area is exposed to sediment. Accordingly, surface area is assumed to be 5,800 cm<sup>2</sup> for the RME scenario and 5,000 cm<sup>2</sup> for the CT scenario.

The estimates for absorption factors for the utility workers are assumed to be the same as those for the routine worker (as described in Section 3.4.8.1).

- **Dermal Contact with Groundwater (Areas 1 and 4B only) While Excavating: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

The dermal contact rate for water exposures is obtained from the product of the exposed skin surface area and the chemical-specific permeability coefficient. The estimates for exposed skin surface area for the utility workers are assumed to be the same as those for the routine worker (as described in Section 3.4.8.1). That is, the exposed skin surface area is 5,800 cm<sup>2</sup> for RME exposures, and 5,000 cm<sup>2</sup> for CT exposures. The entire exposed skin area is conservatively assumed to come in direct contact with groundwater during excavation.

$K_p$  values were estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of 10<sup>-3</sup> cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

For the RME and CT scenarios, the utility worker is conservatively assumed to be engaged in utility work that would bring him in contact with groundwater for eight hours per day, in Areas 1 and 4B only.

- **Ingestion Rate of Groundwater Used Indoors**

For current and future utility worker scenarios, it is assumed that on-site wells installed in the lower aquifer could be used. The ingestion rate for this indoor use is USEPA's default for workers of 1 L/day for CT and 1.4 L/day for RME scenarios (USEPA 1993a).



- **Dermal Contact with Groundwater Used Indoors: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

For current and future scenarios, it is assumed that utility workers could use the water for showering, thereby exposing the total body surface area to groundwater. The RME surface area is assumed to be 23,000 cm<sup>2</sup> corresponding to the 95th percentile of measured total body surface areas for men (USEPA 1992f, 1997c). The central tendency surface area is assumed to be 20,000 cm<sup>2</sup>, based on the mean total body surface areas for men (USEPA 1992f, 1997c).

$K_p$  values were estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of 10<sup>-3</sup>cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

The RME exposure time is 20 minutes per shower and the CT exposure time is 10 minutes per shower (EPA, 1997c).

- **Inhalation Rate of Groundwater Used Indoors**

For current and future utility worker scenarios, it is assumed that on-site wells installed in the lower aquifer could be used. The inhalation rate for this indoor use is USEPA's default for workers of 20 cubic meters (m<sup>3</sup>)/day.

#### **3.4.9.2 Exposure Frequency.**

- **Frequency of Incidental Ingestion of Surface and Subsurface Soil (Areas 1, 2, and 3)**

Excavation activities for utility workers in Areas 1, 2, and 3 are assumed to be conducted for two work-weeks per year (i.e., 10 days/year) for the RME scenario and one work-week (i.e., 5 days/year) for the CT scenario, based on the time estimated to maintain underground utility lines (ENVIRON 1998).

- **Frequency of Dermal Contact with Surface and Subsurface Soil (Areas 1, 2, and 3)**

The frequency of dermal contact with soil during utility work is assumed to be the same as the frequency of incidental ingestion. Thus, the exposure frequency is assumed to be 10 days per year for the RME scenario and five days/year for the CT scenario.

- **Frequency of Incidental Ingestion of Sediment (Area 4B only)**

Excavation activities for utility workers in Area 4B are assumed to be conducted for two work-weeks per year (i.e., 10 days/year) for the RME scenario and one work-

week (i.e., 5 days/year) for the CT scenario, based on the time estimated to maintain underground utility lines (ENVIRON 1998).

- **Frequency of Dermal Contact with Sediment (Area 4B only)**

The frequency of dermal contact with sediment in Area 4B during utility work is assumed to be the same as the frequency of incidental ingestion. Thus, the exposure frequency is assumed to be 10 days per year for the RME scenario and five days/year for the CT scenario.

- **Frequency of Inhalation of Vapor and Particulates in Ambient Air**

As noted above, the utility worker is assumed to be engaged in activities to maintain underground utility lines for 10 days per year under the RME scenario and five days per year under the CT scenario. The inhalation rate for the excavation worker is 20 m<sup>3</sup>/day (USEPA 1991a).

- **Frequency of Dermal Contact with Groundwater While Excavating**

The frequency with which a worker may have dermal contact with water while excavating is assumed to be equal to the frequency an excavation worker may incidentally ingest soil. Thus, the exposure frequency is assumed to be 10 days per year for the RME scenario and five days/year for the CT scenario.

- **Frequency of Ingestion of Groundwater Used Indoors**

It is assumed that current and future utility workers would ingest the water each work day. Thus, the exposure frequency for ingestion of water is 250 days per year under the RME scenario and 219 days per year for the CT scenario.

- **Frequency of Dermal Contact with Groundwater Used Indoors**

It is assumed that current and future utility workers could use the water for showering during each work day. Thus, the exposure frequency for dermal contact is 250 days per year for the RME scenario and 219 days per year for the CT scenario.

- **Frequency of Inhalation of Vapors from Groundwater During Indoor Use**

It is assumed that current and future utility workers could use the water for showering during each work day. Thus, the exposure frequency for inhalation exposures is 250 days per year for the RME scenario and 219 days per year for the CT scenario.

**3.4.9.3 Exposure Duration.** For the RME scenario, the worker is expected to work at the facility for 25 years, based on the standard default for worker tenure at one location (USEPA 1991a). For the CT scenario, the worker is expected to work at the facility for five years, based on the USEPA guidance (USEPA 1993a) central tendency value for worker tenure at one location.

**3.4.9.4 Body Weight.** For both the RME and CT scenarios, the body weight of the utility worker is assumed to be 70 kg, based on the mean adult body weight presented in USEPA (1993a, 1997c).

**3.4.9.5 Averaging Times.** For both the RME and CT scenarios, the averaging time for carcinogenic risks is equal to a lifetime of 70 years in days (i.e., 25,550 days). For both the RME and CT scenarios, the averaging time for noncarcinogenic effects is equal to the exposure duration in days. For year-round exposures, such as soil ingestion, the averaging time is equal to the number of days in a year multiplied by the number of years of exposure. For seasonal exposures, such as dermal contact with surface water, the averaging time is equal to the number of days in the season multiplied by the number of years of exposure. For example, the RME scenario averaging time for a worker contacting surface water is calculated: (3 months/12 months) x (365 days/yr) x (25 years), which equals 1,825 days.

#### **3.4.10 On-site Construction Worker**

The exposure factors discussed below correspond to a potential future scenario in which workers engage in building construction activities in Areas 1, 2, 3, and 4B without wearing the proper personal protective equipment currently required by ACS health and safety protocols. The construction worker exposure is inherently a short-term, RME scenario and therefore only RME exposure factors are used for this population.

##### **3.4.10.1 Contact Rates.**

- **Incidental Ingestion Rate of Surface and Subsurface Soil**

The construction worker is assumed to ingest 480 mg of soil per day, based on USEPA (1991a, 1993a).

- **Dermal Contact with Surface and Subsurface Soil: Exposed Skin Surface Area, Soil-Skin Adherence Factor, and Absorption Factor**

Dermal contact with soil is estimated from the product of the exposed skin surface area, the soil-skin adherence factor, and the chemical-specific absorption factor. The product of the exposed skin surface area and the soil-skin adherence factor is known as the dermal soil loading.

Based on USEPA (1992f), soil adherence is assumed to be 1.0 mg/cm<sup>2</sup>-event for RME scenario and 0.2 mg/cm<sup>2</sup>-event for the CT scenario. USEPA (1992f) recommends assuming that a skin area corresponding to 25% of the total body skin area is exposed to soil. Accordingly, surface area is assumed to be 5,800 cm<sup>2</sup>.

The estimates for absorption factors for the construction workers are assumed to be the same as those for the routine worker (as described in Section 3.4.8.1).

- **Inhalation of Vapor and Particulates in Ambient Air**

It was assumed that a construction worker would have a high inhalation rate due to intensive work activities. Therefore, the reasonable maximum exposure inhalation rate for an adult, 30 m<sup>3</sup>/day, was used (USEPA 1991a).

- **Dermal Contact with Groundwater While Constructing/Excavating: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

The dermal contact rate for water exposures is obtained from the product of the exposed skin surface area and the chemical-specific permeability coefficient. The RME estimate for exposed skin surface area for the construction workers is assumed to be the same as that for the routine worker (as described in Section 3.4.8.1). That is, the exposed skin surface area is 5,800 cm<sup>2</sup>. The entire exposed skin area is conservatively assumed to come in direct contact with groundwater during construction and excavation activities.

K<sub>p</sub> values were estimated using Equation 5.8 from USEPA (1992f), and a default K<sub>p</sub> value of 10<sup>-3</sup> cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of 1 cm/hour for K<sub>p</sub> was established based on USEPA (1992f).

The construction worker is conservatively assumed to be engaged in construction work that would bring him in contact with groundwater for eight hours per day, in Areas 1, 4B, and 5B only.

### **3.4.10.2 Exposure Frequency.**

- **Frequency of Incidental Ingestion of Surface and Subsurface Soil**

Construction activities are assumed to be conducted five days per week for nine months or 196 days per year (ENVIRON 1998).

- **Frequency of Dermal Contact with Surface and Subsurface Soil**

The frequency of dermal contact is assumed to be the same as the frequency of incidental ingestion. Thus, the exposure frequency is assumed to be 196 days per year.

- **Frequency of Inhalation of Vapor and Particulates in Ambient Air**

As noted above, the construction worker is assumed to be at the site for 196 days per year.

- **Frequency of Dermal Contact with Groundwater While Excavating**

The frequency with which a worker may have dermal contact with water while excavating is assumed to be equal to the frequency an excavation worker may incidentally ingest soil. Thus, the exposure frequency is assumed to be 196 days per year.

**3.4.10.3 Exposure Duration.** The construction worker is expected to work at the site during the period of construction, or nine months. In the exposure calculation, the exposure duration is expressed as one year because the fraction of the year is accounted for in the exposure frequency.

**3.4.10.4 Body Weight.** The body weight of the construction worker is assumed to be 70 kg, based on the mean adult body weight presented in USEPA (1993a, 1997c).

**3.4.10.5 Averaging Times.** The averaging time for carcinogenic risks is equal to a lifetime of 70 years in days (i.e., 25,550 days). The averaging time for noncarcinogenic effects is equal to the exposure period in days: nine months (274 days).

### **3.4.11 On-site Trespasser**

Potential exposures to trespassers on the site are estimated using exposure factors for adolescents, 9 to 18 years of age. Although other age groups could trespass at the site, adolescent exposures are expected to be more significant than those for adults due to the lower body weight of a 9 to 18 year old, and more significant than those of younger children, who are subject to greater adult supervision.

For the current scenario, it was assumed that trespassers were exposed to soil in Areas 2 and 3; sediment in Areas 2, 4A, and 4B; and surface water in Areas 4A and 4B. For the future scenario, it was assumed that trespassers were exposed to soil in Areas 1, 2, and 3; sediment in Areas 1, 2, 4A, and 4B; and surface water in Areas 1, 2, 4A, and 4B. Although Areas 2 and 3 are currently surrounded by a maintained fence, current exposure to trespassers in these areas is assessed in order to establish the need for control measures.

#### **3.4.11.1 Contact Rates.**

- **Incidental Ingestion Rate of Surface Soil/Sediment**

The potential trespasser is assumed to ingest 100 mg of soil/sediment (50 mg of soil and 50 mg of sediment) per day under the RME scenario, and 50 mg of soil/sediment

(25 mg of soil and 25 mg of sediment) per day under the CT scenario. Consistent with USEPA guidance (1991a, 1997c), these ingestion rates are based on the adult soil ingestion rates presented in Calabrese et al. (1990). These ingestion rates are conservative in that they assume that all of the soil ingested each day is from the site.

- **Dermal Contact with Surface Soil/Sediment: Exposed Skin Surface Area, Soil-Skin Adherence Factor, Absorption Factors**

The trespasser is assumed to contact soil/sediment while walking through on-site Areas 1, 2, and 3 or while loitering in on-site Areas 4A and 4B.

Based on USEPA (1992f), soil adherence is assumed to be 1.0 mg/cm<sup>2</sup>-event for the RME scenario and 0.2 mg/cm<sup>2</sup>-event for the CT scenario. USEPA (1992f) recommends assuming that a skin area corresponding to 25% of the total body skin area is exposed to soil. Accordingly, surface area is assumed to be 4,400 cm<sup>2</sup> for the RME scenario which is 25% of the 95th percentile of total body surface areas for 9 to 18 year olds. Similarly, surface area is assumed to be 3,600 cm<sup>2</sup> for the CT scenario, using 25% of the 50th percentile total body surface areas for this age group.

As described above for other receptors, USEPA's (1998b) chemical-specific absorption factors are conservatively used in this assessment. The generic absorption factors recommended in USEPA (1998b) guidance of 10% for organics and 1% for inorganics are used for all other chemicals.

- **Inhalation of Vapor and Particulates in Ambient Air**

The potential trespasser is assumed to inhale vapors and particulates from soil at a rate of 20 m<sup>3</sup>/day under both the RME and CT scenarios (USEPA 1991).

- **Incidental Ingestion Rate of Surface Water**

Under the RME and CT scenarios, the trespasser is assumed to incidentally ingest 0.05 liters of water per day while engaging in recreational activities on-site such as splashing water in the marsh in Area 4A or the occasional puddle in Areas 1, 2, 3, and 4B. The ingestion rate is conservatively based on the amount of water expected to be ingested while swimming, 0.05 L/hour, presented in USEPA (1989), and the assumption that the trespasser will contact surface water for two hours per day.

- **Dermal Contact with Surface Water: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

Dermal contact with contaminants in water is estimated from the product of the exposed skin surface area and the chemical-specific permeability coefficient. The body surface areas provided in USEPA (1992f) were used to estimate the exposed surface areas for a trespasser between the ages of 9 and 18. For the RME scenario, the trespasser is assumed to have an exposed skin surface area of 4,400 cm<sup>2</sup>, based

on the assumption that 25% of the trespasser's total body surface area has the potential to contact water and using the 95th percentile of total body surface areas for this age group. For the CT scenario, the trespasser is assumed to have an exposed skin surface area of 3,600 cm<sup>2</sup>, using 25% of the 50th percentile total body surface areas for this age group.

Chemical-specific  $K_p$  values were estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of 10<sup>-3</sup> cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

The trespasser is expected to be on facility property for up to four hours per day under the RME scenario and two hours per day under the CT scenario, consistent with USEPA Region 5 guidance. It is assumed that half the time spent at the site would involve direct contact with marsh or puddle water (i.e., two hours/day and one hour/day for the RME and CT scenarios, respectively).

- **Inhalation Rate of Vapors from Surface Water**

The potential trespasser is assumed to inhale vapors emitted from surface water at a rate of 20 m<sup>3</sup>/day or 0.83 m<sup>3</sup>/hr under both RME and CT scenarios (USEPA 1991).

#### **3.4.11.2 Exposure Frequency.**

- **Frequency of Incidental Ingestion of Soil/Sediment**

The standard default Region 5 exposure frequency for the trespasser scenario is assumed for both the current and future scenarios. Therefore, the frequency of trespassing is 54 days per year under the RME scenario and 12 days per year under the CT scenario. The RME scenario assumes trespassing one day per week in April, May, September, and October and three days per week during the summer months of June, July, and August. The CT scenario assumes one day per week during the summer months of June, July, and August (ENVIRON 1998).

- **Frequency of Dermal Contact with Soil/Sediment**

Dermal contact with soil/sediment is assumed to occur with the same frequency as soil/sediment ingestion. Thus, the exposure frequency is 54 days per year for the RME scenario and 12 days per year for the CT scenario.

- **Frequency of Inhalation of Vapor and Particulates in Ambient Air, including Exposure Time (ET) Term**

The frequency that a trespasser inhales vapor or airborne particulate matter from the site is assumed to be equal to the exposure frequency described above for contact with soil. For the inhalation pathway, the exposure frequency is adjusted with an

exposure time (ET) term to account for the hours per day a receptor is in direct contact with soil in a given area. For example, although it is assumed that a trespasser is on site for 4 hours per day, for areas with both soil and sediment available (e.g., Area 1 and Area 2), it was assumed that one-half that time would be spent contacting soil and the other half would be spent contacting sediment. Therefore, for Areas 1 and 2, the trespasser is assumed to potentially inhale site contaminants for 2 out of 24 hours per day for both the current and future RME scenarios. Sediment was not evaluated in Area 3; therefore, trespassers were assumed to spend all of their time in direct contact with soil and potentially inhale site contaminants for 4 out of 24 hours per day for both the current and future RME scenarios. Central tendency exposures in each area were assumed to be one-half of the RME exposure time.

- **Frequency of Incidental Ingestion of Surface Water**

Under the RME scenario, the trespasser is assumed to incidentally ingest surface water approximately once a week during the summer months, or 12 days per year. Under the CT scenario, the trespasser is assumed to incidentally ingest surface water once a month during the summer months, or three days per year (ENVIRON 1998).

- **Frequency of Dermal Contact with Surface Water**

The frequency that a trespasser may have dermal contact with surface water is assumed to be equal to the frequency that a trespasser may incidentally ingest surface water as described above.

- **Frequency of Inhalation of Vapors from Surface Water (Area 4A only)**

The frequency that a trespasser may inhale vapors from surface water in Area 4A is assumed to be equal to the frequency that a trespasser incidentally ingests surface water. The exposure time is equal to the number of hours per day a trespasser is in direct contact with surface water in the area. Therefore, it was assumed that a trespasser would inhale vapors for 4 hours per day under the RME scenario and 2 hours per day under the CT scenario while trespassing in Area 4A.

**3.4.11.3 Exposure Duration.** An exposure duration of 10 years is assumed for the potential trespasser under the RME scenario, based on the total years in the 9 to 18-year-old age group. CT exposure durations are likely to be much shorter than this given that the site is an active manufacturing facility. In addition, the availability of recreational areas nearby (i.e., Oak Ridge Prairie Park) makes extended trespassing at the site less likely. Therefore, an exposure duration of two years is assumed for the trespasser under the CT scenario (ENVIRON 1998).



**3.4.11.4 Body Weight.** A body weight of 50 kg is used for the trespasser under both the RME and CT scenario, based on the average body weight for individuals ages 9 to 18 years (USEPA 1997c).

**3.4.11.5 Averaging Times.** For both the RME and CT scenarios, the averaging time for evaluating carcinogenic risks is equal to a lifetime of 70 years in days (i.e., 25,550 days). For both the RME and CT scenarios, the averaging time for evaluating noncarcinogenic effects is equal to the exposure duration in days. Since trespassing is expected to be a seasonal exposure (i.e., occurring during only three to seven months of the year), the averaging time is equal to the number of days in the season multiplied by the number of years of exposure. For example, the RME scenario averaging time for a trespasser contacting sediment in Area 4A is calculated: (7 months/12 months) x (365 days/year) x (10 years), which equals 2,129 days.

### **3.4.12 Off-site Resident**

Potential exposures to residential receptors are estimated using exposure factors for adults and for children (ages zero to six).

#### **3.4.12.1 Contact Rates.**

- **Incidental Ingestion Rate of Soil and Sediment**

Under the RME scenario, the adult and child resident are assumed to ingest 100 mg of soil/sediment per day and 200 mg of soil/sediment per day, respectively, based on USEPA (1993a, 1997c). Under the CT scenario, the adult and child resident are assumed to ingest 50 mg/day and 100 mg/day, respectively, based on USEPA (1997c).

- **Dermal Contact with Soil and Sediment: Exposed Skin Surface Area, Soil-Skin Adherence Factor, and Absorption Factor**

Adult and child residents in Area 5A are assumed to contact soil in their yards. The adult and child residents in Area 6 are assumed to contact sediment from a stream in their yard.

Based on USEPA (1992f), soil adherence is assumed to be 1.0 mg/cm<sup>2</sup>-event for the RME scenario and 0.2 mg/cm<sup>2</sup>-event for the CT scenario. USEPA (1992f) recommends assuming that a skin area corresponding to 25% of the total body skin area is exposed to soil. Accordingly, adult surface area is assumed to be 5,800 cm<sup>2</sup> for the RME scenario and 5,000 cm<sup>2</sup> for the CT scenario. Surface area for child

residents is assumed to be 2,100 cm<sup>2</sup> for the RME scenario and 1,800 cm<sup>2</sup> for the CT scenario.

As described above for other receptors, USEPA's (1998b) chemical-specific absorption factors are conservatively used in this assessment. The generic absorption factors recommended in USEPA (1998c) guidance of 10% for organics and 1% for inorganics are used for all other chemicals.

- **Incidental Ingestion Rate of Groundwater During Outdoor Activities**

Residents may contact groundwater while engaging in outdoor activities that could potentially involve the use of groundwater from a private well, such as watering a lawn or washing a car. To evaluate this pathway, the adult resident is assumed to use groundwater while gardening. The child resident is assumed to be exposed to groundwater used in a swimming/wading pool.

Under both the RME and CT scenarios, the adult resident is assumed to ingest 0.05 liters of water per day. This ingestion rate is conservatively based on the amount of water expected to be ingested while swimming, 0.05 L/hour, presented in USEPA (1989) and the expectation that the resident would water the lawn for one hour per day, based on the estimated time spent gardening (USEPA 1997c).

The child resident is assumed to ingest 0.15 liters per day under the RME scenario and 0.05 liters per day under the CT scenario. These ingestion rates are based on USEPA guidance for ingestion while swimming (USEPA 1989) and the assumption that a child spends three hours per day swimming/wading under the RME scenario and one hour per day swimming/wading under the CT scenario (USEPA 1997c).

- **Ingestion Rate of Drinking Water**

Based on the 90th percentile drinking water ingestion rates provided by USEPA (1989, 1991a), RME drinking water rates of 2 L/day for adults and 1 L/day for children were used or ingestion of drinking water obtained from groundwater. For CT exposures, adults are expected to drink 1.4 L/day and children are expected to drink 0.5 L/day, based on average drinking water ingestion rates (USEPA 1989, 1997c).

- **Dermal Contact with Groundwater During Outdoor Activities: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

Dermal contact with contaminants in water is estimated from the product of the exposed skin surface area and the permeability constant for a chemical. The adult resident is assumed to use groundwater for watering the lawn. The assumed exposed skin surface areas while watering the lawn are 5,800 cm<sup>2</sup> for the RME scenario and

5,000 cm<sup>2</sup> for the CT scenario (USEPA 1992f). For both the RME and CT scenarios, the adult resident is expected to water the lawn for one hour per day (USEPA 1997c).

The child resident is assumed to be exposed to groundwater in a swimming/wading pool. The assumed skin surface areas are 8,400 cm<sup>2</sup> for the RME scenario and 7,200 cm<sup>2</sup> for the CT scenario. These are based on the total body surface area of boys and girls, ages one to six (USEPA 1997c). A child resident is assumed to swim/wade for three hours per day and one hour per day for the RME and CT scenarios, respectively (USEPA 1997c).

Chemical-specific  $K_p$  values are estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of  $10^{-3}$  cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

- **Dermal Contact with Groundwater While Adult Showering or Child Bathing: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

While body exposure is used for both the RME and CT showering/bathing scenarios (i.e., 23,000 and 20,000 cm<sup>2</sup> for adults and 8,400 and 7,200 cm<sup>2</sup> for children).

Based on USEPA (1997c), the RME exposure time for an adult shower is 35 minutes per day and the CT exposure time for an adult shower is 10 minutes per day. Based on USEPA (1997c), the RME exposure time for child bathing is 45 minutes per bath and the CT exposure time is 20 minutes.

Chemical-specific  $K_p$  values were estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of  $10^{-3}$  cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

### **3.4.12.2 Exposure Frequency.**

- **Frequency of Incidental Ingestion of and Dermal Contact with Soil**

Under both the CT and RME scenario, adult and child residents in Area 5A are assumed to have an exposure frequency of 350 days per year (USEPA 1991a).

- **Frequency of Incidental Ingestion of Sediment**

The adult resident in Area 6 is assumed to ingest sediment from a stream in his yard during periodic removal of dead branches and leaves from the stream. For the RME scenario, the resident is assumed to clean out the stream one day per month in the Spring (3 months) and Fall (3 months) for a total of 6 days per year. For the CT

scenario, the resident is assumed to clean out the stream for one day in the Spring and one day in the Fall for a total of two days per year (ENVIRON 1998).

The child resident is expected to ingest sediment when playing in and around a stream in his yard. A child is only expected to play near the stream when weather conditions make this form of play appealing, i.e., the water and mud are not too cold. According to data compiled by NOAA (1993), mean temperatures in South Bend, Indiana, are about 70 degrees or warmer for only three months per year (i.e., June, July and August), based on 30 years of data. Thus, playing near the stream would be most attractive to children during the summer months. The sediment would not be available for contact when it is frozen or snow covered. According to data compiled by NOAA (1993), the mean temperatures in South Bend, Indiana, are below freezing for three months per year (i.e., December, January and February). Thus, the sediment is not available for contact during the winter. On this basis, it is assumed that the child resident will play near the stream for four days a week during the summer (13 weeks) and one day per week during the Spring (13 weeks) and Fall (13 weeks) for a total of 78 days per year, under the high end scenario. For the CT scenario, the child resident is assumed to play near the stream for four days a week during the summer only for a total of 52 days per year.

- **Frequency of Dermal Contact with Sediment**

The frequency with which a resident has dermal contact with sediment is assumed to be the same as the frequency a resident may incidentally ingest sediment. Thus, the exposure frequency is six days per year and two days per year for the RME and CT scenarios, respectively, for the adult resident, and 78 days per year and 52 days per year for the RME and CT scenarios, respectively, for the child resident.

- **Frequency of Inhalation of Vapor and Particulates in Ambient Air, including Exposure Time (ET) Term**

The resident is assumed to experience inhalation exposures for 350 days/year for the RME and CT exposure scenarios, based on USEPA (1991a, p. 5) guidance which states "...the common assumption that workers take two weeks of vacation per year can be used to support a value of 15 days per year spent away from home (i.e., 350 days/year spent at home)." The resident is expected to be home for 24 hours per day for the high end scenario. For the CT scenario, the resident is assumed to be home for 18.4 hours out of a 24 hour day (76% of the time), based on recent USEPA (1997c) guidance which states that residents spend 16.4 hours indoors and 2 hours outdoors at one's residence. This is consistent with USEPA (1997c) guidance which states that the average adult spends 64% of his time at home.

In addition, hypothetical residential inhalation exposures are assumed to occur during on-site excavation activities for 10 days/year under the RME scenario and five days/year under the CT scenario, based on the number of days per year workers are expected to excavate on-site to maintain underground utility lines. Residential inhalation exposure during excavation activities is only assumed to occur for eight out of 24 hours per day, based on the length of a standard work day.

- **Frequency of Incidental Ingestion of Groundwater During Outdoor Activities**

For the RME and CT scenarios, the adult resident is assumed to ingest groundwater while watering the lawn for 40 days per year, based on the suggested gardening frequency in USEPA (1992f, 1997c).

For the RME scenario, the child resident is assumed to ingest groundwater while swimming/wading for 36 days per year, which corresponds to the 90th percentile swimming frequency of young children of 12 days per month from mid-June through mid-September (USEPA 1997c).

For the CT scenario, the child resident is assumed to swim in a home swimming/wading pool 9 days per year. This corresponds to the 50th percentile swimming frequency of young children of three times per month (USEPA 1997c) from mid-June to mid-September.

- **Frequency of Ingestion of Drinking Water**

For both the RME and CT scenarios, the resident is assumed to ingest drinking water for 350 days/year, based on the days per year residents are assumed to spend at home (USEPA 1991a).

- **Frequency of Dermal Contact with Groundwater During Outdoor Activities**

The frequency with which a resident may contact groundwater while outdoors is assumed to be equal to the frequency a resident may ingest water outdoors as described above. Thus, the adult resident is assumed to contact groundwater outdoors 40 days per year for the RME and CT scenarios. The child resident is assumed to contact groundwater outdoors 36 days per year under the RME scenario and 9 days per year under the CT scenario.

- **Frequency of Dermal Contact with Groundwater While Showering/Bathing**

For both the RME and CT scenarios, the adult resident is assumed to shower in groundwater for 350 days/year, based on the days per year residents are assumed to spend at home (USEPA 1991a) and an assumed showering frequency of once per day (USEPA 1997c). The child resident (ages 1-6 years) is assumed to take a bath 10 times per week (500 days/year) for the RME scenario and 5 times per week (250 days/year) for the CT scenario.

- **Frequency of Inhalation of Vapors from Groundwater During Household Use Including Exposure Time (ET) Term**

For both the RME and CT scenarios, the adult and child residents are assumed to inhale contaminants from groundwater in their homes for 350 days/year, based on the days per year residents are assumed to spend at home (USEPA 1991a). For the inhalation pathway, the exposure frequency is adjusted by an exposure time (ET) term to account for the hours per day a receptor is expected to inhale contaminants indoors. For the RME scenario, the residents are assumed to be in their home 23.3 hours per day based on the 90th percentile value for the estimated time spent indoors at home presented in USEPA (1997c) guidance. For the CT scenario, the residents are assumed to be in their home 16.4 hours per day based on the 50th percentile value for the estimated time spent indoors at home presented in USEPA (1997c) guidance.

**3.4.12.3 Exposure Duration.** For the RME scenario, the adult resident is assumed to live adjacent to the site for 24 years, based on the 90th percentile for individuals living at one residence (USEPA 1989, 1991a). For the CT scenario, the adult resident is assumed to live adjacent to the facility for 9 years, based on the median number of years that individuals live at one residence (USEPA 1989, 1991a). Under both the RME and CT scenarios, the child resident is assumed to live adjacent to the site for six years, based on the number of years in the child's one to six year old age group.

**3.4.12.4 Body Weight.** For both the RME and CT scenarios, the body weight of the adult resident is assumed to be 70 kg based on the mean adult body weight (USEPA 1997c, 1993a). For both the RME and CT scenarios, the body weight of the child resident is assumed to be 15 kg based on the mean body weight for a child (USEPA 1991a, 1997c).

**3.4.12.5 Averaging Times.** For both the RME and CT scenarios, the averaging time for evaluating carcinogenic risks is equal to a lifetime of 70 years (i.e., 25,550 days). For both the RME and CT scenarios, the averaging time for evaluating noncarcinogenic effects is equal to the exposure duration in days. For year-round exposures, such as showering or bathing, the averaging time is equal to the number of days in a year multiplied by the number of years of exposure. For seasonal exposures, such as swimming in an outdoor pool, the averaging time is equal to the number of days in the season multiplied by the number of years of exposure.

For example, the averaging time for child swimming/wading scenario is calculated: (3 months/12 months) x (365 days/year) x (6 years), which equals 548 days (ENVIRON 1998).

### **3.4.13 Off-site Construction Worker (Area 5B)**

The exposure factors used in the baseline risk assessment for future construction workers engaged in excavation activities in Area 5B are discussed below.

#### **3.4.13.1 Contact Rates.**

- **Dermal Contact with Groundwater While Excavating: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

The dermal contact rate for water exposures is obtained from the product of the exposed skin surface area and the chemical-specific permeability coefficient. The estimates for exposed skin surface area for the excavation workers are assumed to be the same as those for the routine worker (as described in Section 3.4.8.1). That is, the exposed skin surface area is 5,800 cm<sup>2</sup> for RME exposures, and 5,000 cm<sup>2</sup> for CT exposures. The entire exposed skin area is conservatively assumed to come in direct contact with groundwater during excavation.

$K_p$  values were estimated using Equation 5.8 from USEPA (1992f), and a default  $K_p$  value of 10<sup>-3</sup> cm/hour was assigned to those inorganic contaminants that are not listed in USEPA (1992f). An upper limit of one cm/hour for  $K_p$  was established based on USEPA (1992f).

For the RME and CT scenarios, the excavation worker is conservatively assumed to be engaged in excavation work that would bring him in contact with upper aquifer groundwater for eight hours per day, in Area 5B.

- **Inhalation of Vapor in Ambient Air**

The inhalation rate for the construction worker is 20 m<sup>3</sup>/day (USEPA 1991a).

#### **3.4.13.2 Exposure Frequency.**

- **Frequency of Dermal Contact with Surface and Subsurface Soil**

Construction activities are assumed to be conducted five days per week for nine months or 196 days per year.

- **Frequency of Inhalation of Vapor in Ambient Air**

As noted above, the construction worker is assumed to be at the site for 196 days per year.

**3.4.13.3 Exposure Duration.** The construction worker is expected to work at the site during the period of construction, or nine months. In the exposure calculation, the exposure duration is expressed as one year because the fraction of the year is accounted for in the exposure frequency.

**3.4.13.4 Body Weight.** The body weight of the construction worker is assumed to be 70 kg, based on the mean adult body weight presented in USEPA (1993a, 1997c).

**3.4.13.5 Averaging Times.** The averaging time for carcinogenic risks is equal to a lifetime of 70 years in days (i.e., 25,550 days). The averaging time for noncarcinogenic effects is equal to the exposure period in days: nine months (274 days).

#### **3.4.14 Off-site Commercial Worker (Area 5B)**

The exposure factors used in the baseline risk assessment for future off-site exposure to lower aquifer groundwater for commercial workers (e.g., car wash facility) in Area 5B are discussed below.

##### **3.4.14.1 Contact Rates.**

- **Dermal Contact with Groundwater Used Indoors: Exposed Skin Surface Area, Dermal Permeability Coefficient, and Exposure Time**

Workers in Area 5B could use groundwater for commercial / industrial purposes (i.e., auto-detailing car wash). The commercial lower aquifer use evaluated here is that of a labor-intensive, auto-detailing car wash facility. Thus workers would be exposed to a body-soaking water aerosol during every work day. It is conservatively assumed that this type of work would include full-body exposure to groundwater. The RME surface area is assumed to be 23,000 cm<sup>2</sup> corresponding to the 95th percentile of measured total body surface areas for men (USEPA 1992f, 1997c). The central tendency surface area is assumed to be 20,000 cm<sup>2</sup>, based on the mean total body surface areas for men (USEPA 1992f, 1997c).

- **Inhalation Rate of Groundwater Used Indoors**

It is assumed that wells could be installed in the lower aquifer of Area 5B to be used for commercial/industrial purposes. The inhalation rate for this indoor use is USEPA's default for workers of 20 cubic meters (m<sup>3</sup>)/day.



#### **3.4.14.2 Exposure Frequency.**

- **Frequency of Dermal Contact with Groundwater Used Indoors**

If a well is installed in the future, it is assumed that workers would be exposed to groundwater during each work day. Thus, the exposure frequency for dermal contact is 250 days per day for the RME scenario and 219 days per year for the CT scenario.

- **Frequency of Inhalation of Vapors from Groundwater During Indoor Use**

Auto-detailing car wash workers would be exposed to a body-soaking water aerosol during every work day. Thus, the exposure frequency for inhalation exposures is 250 days per year for the RME scenario and 219 days per year for the CT scenario.

**3.4.14.3 Exposure Duration.** For the RME scenario, the commercial worker is expected to work at this location for 25 years, based on the standard default for worker tenure at one location (USEPA 1991a). For the CT scenario, the worker is expected to work at the facility for 5 years, based on the recommended central tendency value for worker tenure at one location (USEPA 1993a).

**3.4.14.4 Body Weight.** For both the RME and CT scenarios, the body weight of the commercial worker is assumed to be 70 kg, based on the mean adult body weight presented in USEPA (1993a, 1997c).

**3.4.14.5 Averaging Times.** For both the RME and CT scenario, the averaging time for carcinogenic risks is equal to a lifetime of 70 years in days (i.e., 25,550 days). For both the RME and CT scenarios, the averaging time for noncarcinogenic effects is equal to the exposure duration in days. Thus for this year-round groundwater exposure, the averaging time is equal to the number of days in a year multiplied by the number of years of exposure (i.e., RME = 25 years x 365 days/year or 9,125 days and CT = 5 years x 365 days/years or 1,825 days).

## 4.0 Toxicity Assessment

The primary objectives of a toxicity assessment are to: (1) identify the types of toxic effects associated with chemicals of potential concern; (2) characterize the conditions (i.e., route and duration) of exposure under which these effects might occur; and (3) determine the relationship between the magnitude of human exposure and the potential for adverse health effects. The following sections discuss the compilation of USEPA-derived toxicity values, and approaches to evaluating potential cancer risk and noncancer hazards when USEPA-derived toxicity values are unavailable (ENVIRON 1998).

### 4.1 USEPA Toxicity Values

The USEPA Integrated Risk Information System (IRIS) is used as the primary source of USEPA-derived toxicity values for chemicals of potential concern at the ACS NPL Site. When a toxicity value is not available in IRIS for a constituent, the most current version of the USEPA Health Effects Assessment Summary Tables (HEAST) is used to obtain toxicity values. The toxicity values compiled from IRIS are current as of October 1998 (USEPA 1998b). The toxicity values compiled from HEAST are current as of the July 31, 1997 edition (USEPA 1997a).

For evaluating carcinogenic risks, USEPA-derived cancer slope factors (CSFs) and unit risk factors (URFs) are compiled for constituents having a USEPA weight-of-evidence classification of group A, B, or C. The CSFs are 95% upper confidence bounds on the risk per unit dose. The risk of developing cancer from exposure to a chemical substance is expected to be less than the risk calculated using the CSF or URF value.

For evaluating noncarcinogenic hazards associated with the potential exposures, USEPA-derived reference doses (RfDs) and reference concentrations (RfCs) are used. The chronic RfD and chronic RfC values represent conservative estimates of the daily exposure which can be received by individuals in the general population, including sensitive subpopulations, that are likely to be without an appreciable risk of deleterious effects during a lifetime (USEPA 1989). The subchronic RfD and subchronic RfC values represent conservative estimates of the daily exposure which can be received by individuals in the general population, including sensitive subpopulations, that are likely to be without an appreciable risk of deleterious effects during a portion of a lifetime (i.e., exposure periods between two weeks and seven years) (USEPA 1989). USEPA's derivations of RfDs and RfCs typically incorporate several uncertainty (or modifying) factors which, in combination, can be as large as 10,000-fold.

Oral CSFs and oral RfDs are used for evaluating oral exposures. For evaluating inhalation exposures, URFs and RfCs are used where available. Dermal exposures are evaluated using oral CSFs and oral RfDs, as discussed in Section 4.2.3. Subchronic toxicity values are used for exposures with averaging periods of less than one year (e.g., swimming exposures that occur only during summer months). The toxicity values compiled from IRIS and HEAST are presented in Tables 4-1 through 4-6, along with their associated reference citations.

As shown in Tables 4-2 and 4-4, IRIS provides several CSFs and URFs for polychlorinated biphenyls (PCBs, including Aroclors 1242, 1248, 1254, and 1260). The cancer potency of PCB mixtures is determined using a tiered approach that depends, in part, on the route of exposure. The “high risk and persistence” CSFs and URFs apply to exposures to PCBs via sediment or soil ingestion, dust inhalation, dermal exposure (if an absorption factor has been applied), and early-life exposures. The “low risk and persistence” CSFs and URFs apply to exposures via ingestion of water-soluble congeners, inhalation of evaporated congeners, and dermal exposure (if no absorption factor has been applied). Tables 4-2 and 4-4 provide the upper-bound slope factors for both tiers.

## **4.2 Constituents Without Published USEPA Toxicity Values**

### **4.2.1 Constituents Without Toxicity Values in IRIS or HEAST**

Several of the constituents detected at or near the Site do not have toxicity values in IRIS or HEAST. USEPA’s National Center for Environmental Assessment (NCEA) has provided toxicity values for the following constituents without any values in IRIS or HEAST: 1,1,1-trichloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2-hexanone, trichloroethene, naphthalene, and cobalt. NCEA has also provided toxicity values for the following constituents which have IRIS and/or HEAST values for some toxicity types, but not for others: benzene, carbon tetrachloride, chlorobenzene, chloroethane, chloroform, chloromethane, ethylbenzene, hexachlorobutadiene, tetrachloroethene, toluene, xylenes (total), and bis(2-ethylhexyl) phthalate.

The toxicity values for the following constituents presented in Tables 4-1 through 4-6 are derived from similar chemicals with toxicity values from IRIS, HEAST or NCEA:

- **m,p-Xylene**

The toxicity values (RfDs) for xylenes (total) are used for the m,p-xylene isomers.

- **o-Xylene**

The toxicity value (RfDs) for xylenes (total) is used for the o-xylene isomer

- **Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene**

These carcinogenic polycyclic aromatic hydrocarbons (PAHs) are assigned oral CSF values following USEPA guidance (1993b), which provides cancer potency values for carcinogenic PAHs relative to benzo(a)pyrene.

- **alpha- and gamma-Chlordane**

The toxicity values (CSF, URF, RfD, RfC) for Chlordane from IRIS are used for the isomers alpha- and gamma-Chlordane.

- **Chromium (total)**

In the RI and subsequent characterization studies, chromium was measured as chromium (total), rather than speciated chromium (III) and chromium (VI). Hexavalent chromium, unlike trivalent chromium, is evaluated by USEPA as a human carcinogen. The chromium detected in soil/sediment is assumed to be present as trivalent chromium and therefore the toxicity data for chromium (III) is used. Hexavalent chromium is highly soluble and trivalent chromium is relatively insoluble (EPA 1989b). In addition, studies indicate that under most common aquifer conditions the hexavalent form predominates in solution (Henderson 1994). Therefore, the toxicity data for chromium (VI) was used to evaluate chromium exposure in groundwater and surface water.

- **Endosulfan I**

The toxicity values (RfDs) for Endosulfan are used for Endosulfan I.

## **4.2.2 Lead**

**4.2.2.1 Child Lead Exposures.** USEPA typically evaluates the health effects of lead in children by using blood lead levels as an index of exposure, rather than through a comparison of lead uptake to an RfD. For evaluating exposure of children to lead in soil, other environmental media, and the diet, USEPA has developed an Integrated Exposure Uptake Biokinetic (IEUBK) model to estimate blood lead levels (USEPA 1994b). Current USEPA Office of Solid Waste and Emergency Response (OSWER) guidance calls for the establishment of cleanup goals so that a typical child or group of children with similar exposure would have an estimated risk of no more than 5 percent exceeding a blood lead level of 10 µg/dL (USEPA 1996b, 1994c). USEPA (1994c, p. 8) states that “this 10 µg/dL blood lead level is based upon analyses conducted by the Centers for Disease Control and EPA that associate blood lead levels of 10 µg/dL and higher with health effects in children; however, this blood lead level is below a level that would trigger medical intervention.” The IEUBK

model is used in this assessment to evaluate the potential for elevated (> 10 µg/dL ) blood lead levels in child residents under current and future land use exposure scenarios.

**4.2.2.2 Adult/Fetal Lead Exposures.** Blood lead levels are also used to evaluate blood lead levels in the fetuses of females of child-bearing age exposed to lead in soil. The USEPA action level of 10 µg/dL is used to evaluate the fetal blood lead levels of worker and trespasser populations in this assessment. Because the IEUBK model is not applicable to adults, USEPA (1996b) has developed an interim method for assessing risks associated with adult exposures to lead in soil. USEPA's blood lead model for adults estimates blood lead levels resulting from exposure to lead at a Site as the sum of a baseline component and a Site-related component. The baseline component accounts for a non-Site-related (i.e., background) uptake of lead through diet, air, water, and soil/dust. The Site-related contribution to blood lead level is predicted by correlating Site-related uptake of lead from soil with blood lead level using a biokinetic slope factor (BKSF). The calculation of total blood lead level in an adult is calculated as follows (USEPA 1996b):

$$PbB_{adult,central} = PbB_{adult,O} + \frac{PbS \cdot BKSF \cdot IR_S \cdot AF_S \cdot EF_S}{AT} \quad \text{Equation (6)}$$

where:

- $PbB_{adult,central}$  = central estimate of blood lead levels in adults exposed to Site soils (µg Pb/dL blood);
- $PbB_{adult,O}$  = typical or baseline blood lead level in adults in the absence of exposures to the Site (µg Pb/dL blood);
- $PbS$  = average Site soil lead concentration (mg/kg);
- $BKSF$  = biokinetic slope factor relating theoretical increase in typical adult blood lead level to average daily lead uptake (µg Pb/dL blood increase per µg Pb/day);
- $IR_S$  = ingestion rate of soil (g/day);
- $AF_S$  = gastrointestinal absorption fraction for lead ingested from soil (unitless);
- $EF_S$  = exposure frequency for contact with Site soils (days/year); and
- $AT$  = averaging time; the total period during which Site soil contact may occur (days/year).

The blood lead level calculated using the above empirical model,  $PbB_{adult,central}$ , represents a geometric mean corresponding to typical exposure patterns and typical lead

concentrations in soil. Variations in blood lead level in the fetuses of an adult population (e.g., workers) exposed to lead are estimated by multiplying the calculated geometric mean blood lead level by an appropriate geometric standard deviation (GSD), as follows:

$$PbB_{fetal,0.95} = PbB_{adult,central} \cdot GSD_{adult}^z \cdot R_{fetal/maternal} \quad \text{Equation (7)}$$

where:

- $PbB_{adult,0.95}$  = 95th percentile blood lead level among fetuses born to exposed workers, i.e., there is a 95 percent likelihood that a fetus born to an exposed worker would have a blood lead level no greater than  $PbB_{adult,0.95}$  ( $\mu\text{g Pb/dL blood}$ );
- $PbB_{adult,central}$  = central estimate of blood lead levels in adults exposed to Site soils ( $\mu\text{g Pb/dL blood}$ );
- $GSD_{adult}$  = geometric standard deviation of blood lead in an adult population (unitless);
- $z$  = standard normal deviation used to calculate a specific percentile from a lognormal distribution of blood lead levels (unitless); and
- $R_{fetal/maternal}$  = theoretical constant of proportionality between fetal blood lead level at birth and maternal blood lead level (unitless).

Equation (7) can be refined to calculate the individual probability of a fetus population associated with a target blood lead level, by first calculating the  $z$  value and then looking up the percentile corresponding to the  $z$  value in a standard normal distribution table:

$$z \text{ value} = \frac{\log(\text{Target } PbB_{fetus,percentile}) - \log(PbB_{fetus,central} * R_{fetal/maternal})}{\log(GSD_{adult})}$$

**Equation (8)**

In the baseline risk assessment, USEPA's adult blood lead model is used to evaluate theoretical blood lead levels in potential fetuses of current and future female routine workers of child-bearing age, future female construction workers of child-bearing age, and current and future female trespassers (age 9 to 18) at the ACS Site, due to exposure to lead in on-Site soil.

USEPA (1996b) recommends that the adult blood lead model not be used for scenarios in which the exposure duration is less than 90 days, or for scenarios in which the exposure

frequency is less than one day/week. Since the high-end exposure frequency for the excavation worker is assumed to be 10 days/year (see Section 3.4.9.2), the USEPA adult blood lead model is not used to assess the theoretical blood levels in the fetuses of this population.

The exposure parameters to be used in the adult blood lead model for the fetuses of workers and trespassers are the same as the default exposure parameters presented in USEPA (1996b) guidance, with the exception of the following Site-specific adjustments:

- **Baseline blood lead level ( $PbB_{adult,O}$ ):** A geometric mean baseline blood lead level of 2.6  $\mu\text{g/dL}$  is used for the workers (men and women). The value is derived from data for white males and females ages 17 to 65 from Phase 1 of the Third National Health and Nutritional Examination Survey (NHANES III). The baseline blood lead level for white males and females ages 17 to 65 is used since the ethnicity of the majority of the population in Griffith, Indiana, and the majority of the workforce at the ACS Site is white, and this age group is representative of the working years. A geometric mean baseline blood lead level of 1.7  $\mu\text{g/dL}$  is used for the female workers of child-bearing age and female trespassers in order to predict theoretical blood lead levels in potential fetuses. This value is derived from data for white females ages 17 to 45 from Phase I of NHANES III. The baseline blood lead level of white females ages 17 to 45 is used since the majority of the population in Griffith, Indiana, and the majority of the workforce at the ACS Site is white, and this age group is representative of the child-bearing years. It should be noted that use of this value for female trespassers (age 9 to 18) may underestimate or overestimate blood lead levels in their fetuses. On the one hand, the NHANES value may overestimate teenage blood lead levels since the geometric mean blood lead level for white females between the ages of 12 and 19 is reported to be 1.0  $\mu\text{g/dL}$ , based on Phase I of the NHANES III data (Brody et al. 1994). Conversely, radionuclide data supports an adolescent growth spurt during this age period, which may result in a shift of lead from blood to bone. Recently deposited bone lead would be readily mobilized during pregnancy, with direct transfer to the fetus.
- **Soil Lead:** Site soil lead concentrations for current scenarios were determined from samples 0 to 2 feet bgs. Because no samples were collected from 0 to 2 feet in Area 2, samples collected from 2-4 feet bgs were used to evaluate current scenarios. Samples collected from 0 to 10 feet bgs were used to evaluate future scenarios. In Areas 1, 4A, and 4B the lower of the 95th UCL

of the lead concentrations or the maximum detected concentrations was used as soil lead concentration per the EPA's request. The maximum detected concentrations were used in Areas 2 and 3.

- Exposure Frequency ( $E_f$ ): An exposure frequency of 219 days per year is used for the routine workers (men and women) and for female routine workers of child-bearing age, based on the typical Site-specific exposure frequency estimated for routine workers as described in Section 3.4.8.2. An exposure frequency of 196 days per year is used for the construction workers (men and women) and for female construction workers of child-bearing age. An exposure frequency of 12 days per year is used for the trespassers, based on the typical Site-specific exposure frequency estimated for trespassers as described in Section 3.4.11.2.
- Averaging Time (AT): An averaging time of 91 days is used for the trespassers, based on the typical Site-specific averaging time estimated for trespassers as described in Section 3.4.11.5.
- Ingestion Rate ( $I_r$ ): A soil ingestion rate of 0.1 g/day (100 mg/day) is used for construction workers (men and women) and for female construction workers of child-bearing age, based on the typical soil ingestion rate of 100 mg/day for construction workers described in Section 3.4.10.1.

#### **4.2.3 Route-to-Route Extrapolation**

USEPA-derived dermal toxicity values are not available for any chemical. Therefore, a quantitative evaluation of cancer risk and noncancer effects for this route of exposure is not possible without performing independent evaluations of toxicity data in the open literature to derive toxicity values, or using toxicity values available for another route of exposure to approximate toxicity values for dermal exposure (USEPA 1989). Given the large number of chemicals evaluated at the ACS Site, this baseline risk assessment is based on a route-to-route extrapolation using available USEPA-derived toxicity values to allow a quantitative analysis of the dermal exposure pathways.

Oral toxicity values may be based on either administered or absorbed doses. USEPA (1989) recommends that oral toxicity values which are expressed as administered doses be adjusted to absorbed doses for evaluation of the dermal pathway. Such adjustment should be performed when "a scientifically defensible data base exists and demonstrates that the gastrointestinal absorption of the chemical in question, from a medium similar to the one employed in the critical study, is significantly less than 100%" (USEPA 1997b). USEPA (1997b) provides recommended gastrointestinal (GI) absorption values for several chemicals.



These values are used to calculate dermal toxicity factors where available. When chemical-specific absorption values are unavailable, oral toxicity criteria are used without adjustment to evaluate dermal exposures.

## 5.0 Risk Characterization

This section provides a characterization of the potential human health risks associated with the exposure scenarios evaluated in Section 3 using the toxicity values discussed in Section 4. For all contaminants except lead, the potential cancer risks and noncancer hazards are evaluated in Section 5.1. Potential exposures to lead are evaluated in Section 5.2. Uncertainties associated with the risk characterization are presented in Section 6.0.

### 5.1 Cancer Risks and Noncancer Hazards

Substances classified as potential carcinogens are assumed by USEPA to pose a cancer risk at all finite exposure levels. In characterizing cancer risks, therefore, a "no-threshold" assumption is generally applied by USEPA for all potentially carcinogenic substances. Although the "no-threshold" assumption may not apply for some classes of carcinogens that act through a mechanism that requires a threshold dose to be exceeded prior to initiation of the carcinogenic process, USEPA's "no-threshold" assumption is conservatively applied for all potential carcinogens in this baseline risk assessment. Actual risks may be less than those estimated using the "no-threshold" approach and USEPA toxicity values.

Given the "no threshold" assumption when evaluating substances classified as carcinogenic, USEPA characterizes cancer risk as the upper bound probability of developing cancer as a result of lifetime exposure to a substance. Thus, estimates of lifetime chronic daily intake (CDI) for each contaminant for each route of potential exposure are multiplied by the route-specific cancer slope factor (CSF) or unit risk factor (URF) for the contaminant to estimate hypothetical incremental lifetime cancer risk, as follows:

$$\text{Cancer Risk} = \text{CDI}_{\text{route}} \cdot \text{CSF}_{\text{route}} \text{ or } \text{CDI}_{\text{route}} \cdot \text{URF}_{\text{route}} \quad \text{Equation (11)}$$

Because of the "no-threshold" assumption, the potential cancer risk associated with exposure to a carcinogenic substance is zero only if the exposure is zero.

In evaluating the potential for adverse noncancer health effects, the USEPA generally relies on a hazard quotient approach. The hazard quotient (HQ) is the ratio of the calculated dose to the dose below which adverse effects are not anticipated. If the HQ is less than or equal to 1, it is assumed that there is little or no potential for deleterious effects as a result of the exposure. If the HQ exceeds 1, it is assumed that the potential exists for noncancer health effects to occur as a result of the exposure. It should be emphasized that an HQ value of greater than 1 does not indicate that adverse health effects

are expected to occur, but rather that they have the potential to occur, and that a closer evaluation may be warranted.

To calculate an HQ value, the estimated daily intake for each contaminant for each route of potential exposure is divided by the route-specific noncancer reference dose (RfD) or reference concentration (RfC) for the contaminant, as follows:

$$\text{Hazard Quotient} = \frac{\text{Intake}_{\text{route}}}{\text{RfD}_{\text{route}}} \text{ or } \frac{\text{Intake}_{\text{route}}}{\text{RfC}_{\text{route}}} \quad \text{Equation (12)}$$

The central tendency and RME estimates of intake that were used in calculating potential cancer risks and adverse noncancer hazards have been calculated using the central tendency and RME exposure factors presented in Section 3.3. These central tendency and RME estimates are presented separately for each media in Tables 5-1-1 through 5-1-132 for soil, 5-2-1 through 5-2-48 for sediment, 5-3-1 through 5-3-30 for surface water, and 5-4-1 through 5-4-84 for groundwater. Corresponding central tendency and RME estimates of potential cancer risks and HQ values are also presented in these tables.

The central tendency and RME estimates of cancer risk and HQ values have been calculated to account for the potential variables in the doses received across a potentially exposed population. Potential variables in susceptibility (i.e., toxicity) across the exposed population are addressed by using USEPA toxicity values in calculating both the central tendency and RME estimates. These USEPA toxicity values are developed using approaches which are intended to be protective of especially susceptible members of the general population, such as children. The toxicity values are thus considered to be conservative, i.e., more likely to overestimate than to underestimate risk.

For example, RfDs and RfCs typically incorporate an uncertainty factor of 10 to account for the presence of potentially susceptible individuals, while CSFs and URFs are based on the 95th upper confidence limit (UCL) of the estimated cancer potency.

Potential cancer risk and noncancer hazards associated with cumulative exposure to the combination of contaminants at each area are estimated using the equations below, as required by USEPA guidance (USEPA 1989):

$$\text{Cancer Risk}_{\text{cumulative}} = \sum \text{Cancer Risk}_i \quad \text{Equation (13)}$$

$$\text{HI} = \sum \text{HQ}_i \quad \text{Equation (14)}$$

where:

Cancer Risk <sub>cumulative</sub>	=	cumulative cancer risk from all contaminants
Cancer Risk <sub>i</sub>	=	cancer risk for the <i>i</i> th contaminant
HI	=	cumulative hazard index from all contaminants
HQ <sub>i</sub>	=	hazard quotient for the <i>i</i> th contaminant

According to USEPA (1989, 1991b), the cumulative baseline cancer risk and hazard index (HI) for a Site should include all media and pathways that the RME exposure scenario indicates are appropriate to combine. However, according to USEPA guidance, RME cancer and noncancer risk estimates for more than one pathway should not be combined unless an individual is likely to consistently face the RME exposure via more than one pathway simultaneously. As a conservative measure, cumulative cancer risks and HI values have been calculated by summing across all exposure pathways under each scenario in this baseline risk assessment.

As discussed in USEPA (1989), "application of the hazard index equation to a number of compounds that are not expected to induce the same type of effects or that do not act by the same mechanism, although appropriate as a screening-level approach, could overestimate the potential for effects" (p.8-14). Thus, consistent with USEPA (1989) guidance, exposures to compounds are segregated by effect and mechanism of action in those instances where the HI value calculated by summary across all contaminants exceeds 1.0 in the risk assessment.

The central tendency and RME estimates of cancer risks and HIs for each potentially exposed population are presented by route of exposure and by Area in the Pathway-Specific Carcinogenic and Noncarcinogenic Risk Tables (i.e., Tables 5-1-1 through 5-1-132 for soil, 5-2-1 through 5-2-48 for sediment, 5-3-1 through 5-3-30 for surface water, and 5-4-1 through 5-4-84 for groundwater). The text discusses the RME estimates for each population evaluated and discusses the central tendency values only for populations whose RME estimate exceed USEPA action levels. Uncertainties associated with the risk characterization are discussed in Section 6.0. It should be emphasized that the current future groundwater exposures in on-Site and off-Site areas are based on the maximum concentrations since these exposures are point-source exposures.

According to EPA policy, the target total individual risk resulting from exposures at a Superfund site may range anywhere between 1E-06 and 1E-04 (USEPA, 1991b). Thus, remedial alternatives should be capable of reducing total potential carcinogenic risks to levels within this range for individual receptors. OSWER Directive 9355.0-30, issued on April 22, 1991, provides further insight into the acceptable risk range when it states: "Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less than  $10^{-4}$ , and the non-carcinogenic hazard quotient is less than 1, action generally is not warranted unless there are adverse environmental impacts. However, if MCLs or non-zero MCLGs are exceeded,

action generally is warranted. A risk manager may also decide that a baseline risk level less than  $10^{-4}$  is unacceptable due to site-specific reasons and that a remedial action is warranted. The upper boundary of the risk range is not a discrete line at  $1 \times 10^{-4}$ , although USEPA generally uses  $1 \times 10^{-4}$  in making risk management decisions. A specific risk estimate around  $10^{-4}$  may be considered acceptable if justified based on site-specific conditions.”

### **5.1.1 Current and Future Exposure Scenarios**

The central tendency and RME cumulative cancer risks and noncancer HI's for all routes of exposure for each population by Area are presented in the Summary Risk Tables, Tables 6-1-1 through 6-1-25 for Area 1, 6-2-1 through 6-2-20 for Area 2, 6-3-1 through 6-3-10 for Area 3, 6-4-1 through 6-4-4 for Area 4A, 6-5-1 through 6-5-14 for Area 4B, 6-6-1 through 6-6-16 for Area 5A, 6-7-1 through 6-7-3 for Area 5B, 6-8-1 through 6-8-4 for Area 6, and 6-9-1 and 6-9-2 for site-wide groundwater. The Summary Risk Tables are given a new primary number (i.e., 6-) in order to more easily distinguish them from the Pathway Risk Tables (i.e., 5-). Finally, cumulative risks and HIs for each receptor in each area are given in Tables 7-1 through 7-4.

The subsequent subsections (i.e., 5.1.1.1 and 5.1.1.2) discuss the receptor population in each area with the highest cancer risk and HI. The media and the specific contaminant(s) contributing the most risk to this maximum receptor population is also identified. The cancer risks and HIs for all other receptor populations are presented in the aforementioned tables. Subsection 5.1.1.3 discusses the contaminants which contribute the bulk of the risk in each media by area. The specific location of these contaminants is also listed.

**5.1.1.1 Current Exposures.** The receptor population with the highest current risk in Area 1 is the utility worker with an RME risk of  $2.7 \times 10^{-2}$  (Tables 7-1, 6-1-1, 6-1-3, and 6-1-5) and a CT risk of  $7.6 \times 10^{-5}$  (Tables 7-2, 6-1-2, 6-1-4, and 6-1-6). This is primarily due to dermal contact with benzene, tetrachloroethene, and PCBs in soil (0-10'). The receptor population with the highest HI is once again the utility worker with an RME HI of 4,100 and a CT HI of 2,700 (Tables 7-1 and 7-2). This is primarily due to dermal contact with benzene in groundwater (upper aquifer) (Tables 6-1-5 and 6-1-6).

The receptor population with the highest risk in Area 2 is the utility worker with an RME risk of  $1.6 \times 10^{-1}$  (Tables 7-1 and 6-2-1) and a CT risk of  $5.2 \times 10^{-3}$  (Tables 7-2 and 6-2-2). This is primarily due to dermal contact with aroclor 1260 and aldrin in soil (2-10'). The receptor population with the highest HI is also the utility worker with an RME HI of 2,800 (Tables 7-1 and 6-2-1) and a CT HI of 430 (Tables 7-2 and 6-2-2). This is primarily due to dermal contact with aldrin, antimony, aroclor 1254, and cadmium in soil (2-10').

The receptor population with the highest current risk in Area 3 is the utility worker with an RME risk of  $8.0 \times 10^{-2}$  (Tables 7-1 and 6-3-1) and a CT risk of  $2.6 \times 10^{-3}$  (Tables 7-2 and 6-3-2). This is primarily due to dermal contact with aroclor 1242, aroclor 1248, benzene and tetrachloroethene in soil (0-10'). The receptor population with the highest HI is also the utility worker with an RME HI of 7,000 (Tables 7-1 and 6-3-1) and a CT HI of 1,100 (Tables 7-2 and 6-3-2). This is primarily due to dermal contact with antimony, aroclor 1254, cadmium, and tetrachloroethene in soil (0-10').

The receptor population with the highest risk in Area 4A is the trespasser with an RME risk of  $1.6 \times 10^{-5}$  (Tables 7-1, 6-4-1, and 6-4-3) and a CT risk of  $2.4 \times 10^{-7}$  (Tables 7-2, 6-4-2, and 6-4-4). This is primarily due to dermal contact with aroclors, arsenic, and benzo(a)pyrene in sediment. The receptor population with the highest HI is also the trespasser with an RME HI of 3.9 (Tables 7-1, 6-4-1, and 6-4-3) and a CT HI of 1 (Tables 7-2, 6-4-2, and 6-4-4). This is primarily due to dermal contact with aroclor 1254 in sediment.

The receptor population with the highest current risk in Area 4B is the trespasser with an RME risk of  $1.7 \times 10^{-5}$  (Tables 7-1, 6-5-11, and 6-5-13) and a CT risk of  $2.7 \times 10^{-7}$  (Tables 7-2, 6-5-12, and 6-5-14). This is primarily due to dermal contact with aroclor 1254 and arsenic in sediment. The receptor population with the highest HI is also the trespasser with an RME HI of 2.4 (Tables 7-1, 6-5-11, and 6-5-13) and a CT HI of 0.25 (Tables 7-2, 6-5-12, and 6-5-14). This is primarily due to dermal contact with aroclor 1254 and cadmium in sediment.

The receptor population with the highest risk in Area 5A is the resident with an RME excess lifetime cancer risk of  $6.0 \times 10^{-4}$  (Table 7-1) and a CT excess lifetime cancer risk of  $7.6 \times 10^{-5}$  (Table 7-2). This is primarily due to dermal contact with aroclor 1254, arsenic, and benzo(a)pyrene in soil (0-2') (Tables 6-6-1 through 6-6-16). The receptor population with the highest HI is the child resident with an RME HI of 540 (Tables 7-1, 6-6-1, and 6-6-5) and a CT HI of 96 (Tables 7-2, 6-6-2, and 6-6-5). This is primarily due to dermal contact with antimony, aroclor 1254, beryllium, iron and the inhalation of chloroform in soil (0-2').

There are no current receptor populations in Area 5B and thus no current risks were evaluated here.

The receptor population with the highest risk in Area 6 is the resident with an RME excess lifetime cancer risk of  $5.2 \times 10^{-5}$  (Tables 7-1 and 6-8-1) and a CT excess lifetime cancer risk of  $7.6 \times 10^{-6}$  (Tables 7-2 and 6-8-3). This is primarily due to ingestion of arsenic and benzo(a)pyrene in sediment. The receptor population with the highest HI is the child resident with an RME HI of 2.9 (Tables 7-1 and 6-8-1) and a CT HI of 1.3 (Tables 7-2 and 6-8-3). This is primarily due to the ingestion of arsenic, iron, and manganese and dermal contact with antimony, beryllium, and cadmium.

**5.1.1.2 Future Exposures.** Excluding exposure to lower aquifer groundwater (which is discussed in the last paragraph of this subsection), the receptor population with the highest future risk in Area

1 is the utility worker with an RME risk of  $2.7 \times 10^{-2}$  (Tables 7-3, 6-1-1, 6-1-3, and 6-1-5) and a CT risk of  $7.6 \times 10^{-5}$  (Tables 7-4, 6-1-2, 6-1-4, and 6-1-6). This is primarily due to dermal contact with benzene and tetrachloroethene in soil (0-10'). The receptor population with the highest HI is the construction worker with an RME HI of 6,700 (Tables 7-3, 6-1-15, 6-1-16, and 6-1-17). This is primarily due to dermal contact with benzene in upper aquifer groundwater.

Excluding exposure to lower aquifer groundwater, the receptor population with the highest risk in Area 2 is the utility worker with an RME risk of  $1.6 \times 10^{-1}$  (Tables 7-3 and 6-2-1) and a CT risk of  $5.2 \times 10^{-3}$  (Tables 7-4 and 6-2-2). This is primarily due to dermal contact with aroclor 1260, aldrin, and bis(2-chloroethyl)ether in soil (2-10'). The receptor population with the highest HI is the construction worker with an RME HI of 8,700 (Tables 7-3, 6-2-11, and 6-2-12). This is primarily due to dermal contact with acetone, antimony, benzene, cadmium, and tetrachloroethene and the inhalation of chloroform in soil (2-4').

Excluding exposure to lower aquifer groundwater, the receptor population with the highest risk in Area 3 is the utility worker with an RME risk of  $8.0 \times 10^{-2}$  (Tables 7-3 and 6-3-1) and a CT risk of  $2.6 \times 10^{-3}$  (Tables 7-4 and 6-3-2). This is primarily due to dermal contact with aroclor 1242 and tetrachloroethene in soil (0-10'). The receptor population with the highest HI is the construction worker with an RME HI of 9,300 (Tables 7-3 and 6-3-5). This is primarily due to dermal contact with antimony, cadmium, 4-methyl-2-pentanone and benzene in soil (0-10').

The receptor population with the highest future risk in Area 4A is the trespasser with an RME risk of  $1.6 \times 10^{-5}$  (Tables 7-3, 6-4-1, and 6-4-3) and a CT risk of  $2.4 \times 10^{-7}$  (Tables 7-4, 6-4-2, and 6-4-4). This is primarily due to dermal contact with aroclors, arsenic, and benzo(a)pyrene in sediment. The receptor population with the highest HI is also the trespasser with an RME HI of 3.9 (Tables 7-3, 6-4-1, and 6-4-3) and a CT HI of 1 (Tables 7-4, 6-4-2, and 6-4-4). This is primarily due to dermal contact with aroclor 1254 in sediment.

Excluding exposure to lower aquifer groundwater, the receptor population with the highest risk in Area 4B is the utility worker with an RME risk of  $1.6 \times 10^{-2}$  (Tables 7-3, 6-5-1, 6-5-3, and 6-5-5) and a CT risk of  $5.6 \times 10^{-5}$  (Tables 7-4, 6-5-2, 6-5-4, and 6-5-6). This is primarily due to dermal contact with aroclor 1248 and benzene in the upper aquifer. The receptor population with the highest HI is the construction worker with an RME HI of 4,300 (Tables 7-3, 6-5-7, and 6-5-8). This is primarily due to dermal contact with and inhalation of benzene in the upper aquifer groundwater.

The receptor population with the highest risk in Area 5A is the resident with an RME excess lifetime cancer risk of  $6.8 \times 10^{-4}$  (Table 7-3) and a CT excess lifetime cancer risk of  $1.1 \times 10^{-4}$  (Table 7-4). This is primarily due to dermal contact with aroclor 1254, arsenic, and benzo(a)pyrene in soil (0-2') (Tables 6-6-1 through 6-6-16). The receptor population with the highest HI is the child resident with an RME HI of 580 (Tables 7-3, 6-6-3, and 6-6-7) and a CT HI of 100 (Tables 7-4, 6-6-4, and

6-6-8). This is primarily due to dermal contact with antimony, aroclor 1254, beryllium, iron and the inhalation of chloroform in soil (0-2').

The receptor population with the highest future risk in Area 5B is the commercial worker (car wash) with an RME risk of  $4.9 \times 10^{-3}$  (Tables 7-3 and 6-7-1) and a CT risk of  $8.2 \times 10^{-4}$  (Tables 7-4 and 6-7-3). This is primarily due to inhalation of bis(2-chloroethyl)ether and benzene in lower aquifer groundwater. The receptor population with the highest HI is the construction worker with an RME HI of 420 (Tables 7-3 and 6-7-2). This is primarily due to dermal contact with and inhalation of benzene in the upper aquifer groundwater.

The receptor population with the highest risk in Area 6 is the resident with an RME excess lifetime cancer risk of  $5.2 \times 10^{-5}$  (Table 7-3) and a CT excess lifetime cancer risk of  $7.6 \times 10^{-6}$  (Table 7-4). This is primarily due to ingestion of arsenic and benzo(a)pyrene in sediment (Tables 6-8-1 through 6-8-4). The receptor population with the highest HI is the child resident with an RME HI of 2.9 (Tables 7-3 and 6-8-1) and a CT HI of 1.3 (Tables 7-4 and 6-8-3). This is primarily due to the ingestion of arsenic, iron, and manganese and dermal contact with antimony, beryllium, and cadmium.

In the event that the municipal water supply is supplemented or replaced by onsite (site-wide) wells in the future, the RME risk to onsite workers (routine and utility workers) is  $2.6 \times 10^{-1}$  (Tables 7-3 and 6-9-1) and the CT risk is  $1.8 \times 10^{-4}$  (Tables 7-4 and 6-9-2). This is primarily due to dermal contact with arsenic and bis(2-chloroethyl)ether in lower aquifer groundwater. The RME HI for the future onsite worker is 19 (Tables 7-3 and 6-9-1) and CT HI is 12 (Tables 7-4 and 6-9-2). This is primarily due to ingestion of arsenic, benzene, cadmium, chromium, iron, manganese, and zinc in lower aquifer groundwater.

**5.1.1.3 Maximum Contaminant Locations.** The central tendency and RME cancer risks and/or HIs for all populations exposed to soil in Areas 1, 2, 3 and 5A exceeded USEPA acceptable levels (i.e.,  $1 \times 10^{-4}$  cancer risk and/or an HI of greater than 1). The primary risk-driving contaminants and their maximum locations (Figure 3-3) within in each Area are as follows:

- **Area 1 Surface and Subsurface Soil**

Aroclor - 1242	(TP02-03)
Aroclor - 1254	(TP02-03)
Benzene	(TP02-03)
Chloroform	(TP06-04)
Tetrachloroethene	(TP02-03)
Toluene	(TP02-03)
Trichloroethene	(SB92-03)
1,1,1-Trichloroethane	(TP07-03)
Antimony	(TP06-04)



Beryllium	(TP06-04)
Cadmium	(TP06-04)
• <b>Area 2 Surface and Subsurface Soil</b>	
Acetone	(SA04-0)
Aldrin	(SB39-10)
Aroclor 1254	(T12-S and SB37-10)
Aroclor 1260	(SA02-S and SB78-07)
Chloroform	(SA04-0)
Tetrachloroethane	(SA04-0 and SA04-S)
Toluene	(SA04-0)
1,1,1-Trichloroethane	(SA04-0)
Antimony	(DS01-S)
Cadmium	(DS01-S)
Chromium	(DS01-S)
• <b>Area 3 Surface and Subsurface Soil</b>	
Acetone	(SB30-10)
Aroclor 1242	(TP01-03_5)
Aroclor 1248	(SB48-01 and KP01-S)
Aroclor 1254	(SB48-01 and SB30-10)
Aroclor 1260	(SP02-S)
bis (2-ethylhexyl) phthalate	(SB30-10)
Benzene	(SB30-10)
Ethylbenzene	(SB30-10)
Tetrachloroethene	(SA02-03 and SB30-10)
Toluene	(SB30-10)
Trichloroethene	(SA02-03 and SB30-10)
4-methyl-2-pentanone	(SB30-10)
1,1,1-Trichloroethane	(SB30-10)
Antimony	(SA02-03 and SB30-10)
Barium	(SB30-10)
Cadmium	(SA02-03 and SB30-10)
Copper	(SB30-10)
• <b>Area 5A Surface Soil</b>	
Aroclor 1254	(SS02-001)
Antimony	(SS02-01)

The central tendency and RME cancer risks and/or HIs for many of the populations exposed to sediment in Areas 4A, 4B, 5A, and 6 were less than USEPA acceptable levels (i.e.,  $1 \times 10^{-4}$  cancer risk and/or an HI of greater than 1). Some of the exceptions were as follows:

- The exposure of future utility workers to Area 4B sediment had RME and CT HIs of 5.9 and 1.0, respectively, due primarily to dermal contact with aroclor-1254 at sampling location ST11-101.
- The exposure of future construction workers to Area 4B sediment had an RME HI of 8.0 due primarily to dermal contact with aroclor-1254 at sampling location ST11-101. The RME cancer risks were less than  $1 \times 10^{-5}$ .
- The exposure of current/future child residents to Area 6 sediment had RME and CT HIs of 2.9 and 1.3, respectively, due primarily to ingestion of arsenic and iron at sampling locations SD13-01 and SD14-01, respectively. The RME and CT cancer risks were less than  $5 \times 10^{-5}$ .

The central tendency and RME cancer risks and/or HIs for most populations exposed to surface water in Areas 1, 2, 4A, and 4B were less than  $1 \times 10^{-5}$  cancer risk and an HI of 1. One exception was the RME exposure of current/future trespassers (HI of 1.4) due to inhalation of benzene at SW-09. The RME and CT cancer risks and CT HI were below USEPA acceptable limits for this population.

The central tendency and RME cancer risks and/or HIs for all populations exposed to groundwater in the upper aquifer (on-site and off-site) and lower aquifer (on-site and off-site) exceeded USEPA acceptable levels (i.e.,  $1 \times 10^{-4}$  cancer risk and/or an HI of greater than 1). The primary risk-driving contaminants and the location of their maximum concentration (Figure 3-4) within in each Area are as follows:

- **Upper Aquifer (On-Site)**

Aroclor 1248	(MW04)
Benzene	(MW03)
Ethylbenzene	(MW05)
Toluene	(MW03)
- **Upper Aquifer (Off-Site, Area 5A)**

Benzene	(MW06)
bis (2-ethylhexyl) phthalate	(MW06)
Di-n-octyl phthalate	(MW06)
ethyl benzene	(MW06)
pentachlorophenol	(MW06)
Xylene	(MW06)

- **Upper Aquifer (Off-Site, Area 5B)**  
Benzene (MW48)
- **Lower Aquifer (On-Site)**  
Ammonia (MW09)  
Benzene (MW09)  
bis (2-chloroethyl) ether (MW09)  
bis (2-ethylhexyl) phthalate (MW23)
- **Lower Aquifer (Off-Site, Private Wells)**  
Chloroform (PWC-01)
- **Lower Aquifer (Off-Site, Monitoring Wells)**  
bis (2-ethylhexyl) phthalate (MW36)

The off-site private wells in Area 5A are used to evaluate current risks to residents using the lower aquifer. The off-site monitoring wells in Area 5A are used to evaluate future risks to residents using the lower aquifer. The on-site lower aquifer wells were used to evaluate future risks to off-site commercial workers downgradient in Area 5B.

## 5.2 Blood Lead Levels

### 5.2.1 Child Blood Lead Levels

Version 0.99d of USEPA's IEUBK model is used in this assessment to evaluate blood lead levels in child residents in Areas 5A and 6 under both current and future exposure scenarios. The following Site-specific exposure concentrations were evaluated for use in the IEUBK model to assess potential exposures to lead in air, soil, and drinking water in Areas 5A and 6. USEPA guidance states that at least 95 percent of a modeled population should have blood lead concentrations of 10 µg/dL or less (USEPA 1994c).

- **Air:** The maximum estimated off-site air concentration under the current scenario in Area 5A is 0.0009 µg/m<sup>3</sup>, based on emissions from on-site Areas during routine activities. The maximum estimated off-site air concentration under the future scenario in Area 5A is 0.04 µg/m<sup>3</sup>, based on emissions from on-site Areas during construction activities (ENVIRON 1998). These estimated air concentrations are significantly lower than the default ambient air concentration of 0.1 µg/m<sup>3</sup> presented in the IEUBK model.

The maximum estimated off-site air concentration under the current scenario in Area 6 is 0.0002 µg/m<sup>3</sup>, based on emissions from on-site Areas during routine activities. The maximum estimated off-site air concentration under the future scenario

in Area 6 is  $0.01 \mu\text{g}/\text{m}^3$ , based on emissions from on-site Areas during construction activities (ENVIRON 1998). These estimated air concentrations are significantly lower than the default ambient air concentration of  $0.1 \mu\text{g}/\text{m}^3$  presented in the IEUBK model.

- **Drinking Water:** The estimated drinking water concentration for current exposures in Area 5A is  $22.6 \mu\text{g}/\text{L}$ , based on the maximum lead concentration detected in residential private wells in Area 5A. This value is the maximum of water samples collected from PW-02 (also known as PW-D). It should be noted that the water sample collected from PW-07 contained a higher lead concentration ( $41.7 \mu\text{g}/\text{L}$ ) than those detected in PW-02. However, PW-07 is a closed well at an industrial property where children are not expected to ingest the water.

The estimated drinking water concentration for future exposures in Area 5A is  $11.6 \mu\text{g}/\text{L}$ , based on the maximum lead concentration detected in lower aquifer monitoring wells in Area 5A (i.e., MW-28). Due to poor quality of the shallow aquifer, it is not evaluated for ingestion risk in this assessment. It should be noted that concentrations in both aquifers, on average, are below the Federal Action Level for lead in drinking water ( $15 \mu\text{g}/\text{L}$ ).

Due to the direction of groundwater flow, Site-related contaminants are not expected to be present in groundwater in Area 6.

- **Soil:** The average of the two residential soil samples collected in Area 5A is  $64.8 \text{ mg}/\text{kg}$ . This concentration is less than the default soil lead concentration of  $200 \text{ mg}/\text{kg}$  in the IEUBK model. Soil samples were not collected in Area 6. However, lead was detected in three sediment samples collected in Area 6. The average lead concentration in sediment in Area 6 is  $71.3 \text{ mg}/\text{kg}$ . This concentration is less than the default soil lead concentration of  $200 \text{ mg}/\text{kg}$  presented in the IEUBK model.

Under the current exposure scenario in Area 5A, USEPA default exposure parameters (including an air concentration of  $0.1 \mu\text{g}/\text{m}^3$  and a soil concentration of  $200 \text{ mg}/\text{kg}$ ) are conservatively used in the IEUBK model, with the exception of drinking water concentrations. The results of the IEUBK model for current exposures in Area 5A is depicted in Figure 5-1. Based on the results of the IEUBK modeling, the probability that children that are exposed to an average drinking water concentration of  $22.6 \mu\text{g}/\text{L}$  from a residential well would have blood lead levels greater than  $10 \mu\text{g}/\text{dL}$  is 6.84 percent. Thus, less than 95 percent of the children are calculated to have blood lead levels less than USEPA's blood lead level of concern from children ( $10 \mu\text{g}/\text{dL}$ ), based on the maximum lead concentration in residential wells.

For the future exposure scenario in Area 5A, USEPA default exposure parameters (including an air concentration of  $0.1 \mu\text{g}/\text{m}^3$  and a soil concentration of  $200 \text{ mg}/\text{kg}$ ) are conservatively used in the IEUBK model, with the exception of drinking water concentrations. The results of the IEUBK model for future exposures in Area 5A is depicted in Figure 5-2. Based on the results of the IEUBK modeling, the probability that children are exposed to an average drinking water concentration of  $11.6 \mu\text{g}/\text{L}$  from the lower aquifer would have blood lead levels greater than  $10 \mu\text{g}/\text{dL}$  is 3.24 percent. Thus, at least 95 percent of the children are calculated to have blood lead levels less than USEPA's blood lead level of concern for children ( $10 \mu\text{g}/\text{dL}$ ), based on measured lead concentrations in the lower aquifer off-site.

For Area 6, the only potential routes of exposure to lead from the Site is via air emissions or contact with sediment. As noted above, air concentrations for current and future exposures in Area 6 are less than the default ambient air concentration of  $0.1 \mu\text{g}/\text{m}^3$  presented in the IEUBK model. In addition, the estimated sediment concentration is less than the default soil lead concentration presented in the IEUBK model. Thus, increased blood lead levels in children due to inhalation of ambient air or contact with sediment in Area 6 are not expected.

### **5.2.2 Adult/Fetal Blood Lead Levels**

USEPA's (1996b) adult blood lead model is used to evaluate the potential for increased blood lead levels in the fetuses of current and future routine workers, future construction workers, and future trespassers exposed to surface soil at the ACS Site. The blood lead level calculated for adults using the method described in Section 4.2.2.2 is intended to represent a geometric mean corresponding to typical exposure patterns and typical lead concentrations in the environmental media contacted at a Site. As described in Section 4.2.2.2, variations in fetal blood lead level within an adult child-bearing population (i.e., female workers) are then estimated by multiplying the calculated geometric mean with an appropriate geometric standard deviation (GSD). The individual probability of the fetuses of an exposed adult population expected to exceed a target blood lead level (i.e.,  $10 \mu\text{g}/\text{dL}$ ) was calculated by solving for the  $z$  value and then looking up the percentile corresponding to the  $z$  value in a standard normal distribution table.

Table 6-9-1 shows the individual probability of the fetuses of current and future workers, future construction workers, and future trespassers exposed to Site soils which are expected to exceed the target blood lead level.

### **5.2.2.1 Probability of Fetal Blood Lead Levels Exceeding Target Blood Lead Level.**

Current USEPA Office of Solid Waste and Emergency Response (OSWER) guidance calls for the establishment of cleanup goals so that a typical child or group of children with similar exposure would have an estimated risk of no more than 5 percent exceeding a blood lead level of 10 µg/dL (USEPA 1994c, 1996b). USEPA (1996b) guidance recommends applying a similar 95th percentile goal to the protection of fetuses carried by women who experience nonresidential exposure. As shown in Table 6-9-1, there is a less than 1% chance that fetuses of female routine workers of child-bearing age exposed to site soil in Area 1 and 4B will exceed the blood lead level of 10 µg/dL. However there is a 75% and a 93% chance that the fetuses of female routine workers of child-bearing age exposed to site soil in Areas 2 and 3, respectively will exceed the blood lead level of 10 µg/dL level. Over 98% of the fetuses of female construction workers of child-bearing age in Areas 2 and 3 and 13% in Area 1 are expected to exceed the blood lead level of 10 µg/dL. None of the fetuses of female construction workers of child-bearing age in Area 4B are expected to exceed the blood lead level of 10 µg/dL. Less than 1% of the fetuses of female trespassers in Areas 1, 4A and 4B are expected to exceed the blood lead level of 10 µg/dL. However, 6% of the fetuses of female trespassers exposed to subsurface soil (0-10') in Area 3 are expected to exceed the blood lead level of 10 µg/dL. The fetuses of female trespassers exposed to surface and subsurface soils in area 2 have less than a 5% probability of exceeding the 10 µg/dL blood lead level.

## **5.3 Buried Drums**

Hazardous waste-containing drums were buried in Areas 1, 2, and 3. In Area 1, the drum landfill area consists of two oval areas spanning approximately 250 feet north to south and 450 feet west to east, located in the northern third of the fenced ACS facility. An estimated 400 to 2,500 drums containing sludge and semi-solids of unknown types are buried in this area on their sides and closely packed together (Warzyn, Inc. 1991a; Focus Environmental 1997; Geophysical Study (1998)). The surface throughout this area is generally flat, with no vegetation or surface construction, and covered by coarse sand and gravel. The drums are located approximately one to five feet below ground surface. The Remedial Investigation report (Warzyn, Inc. 1991a) noted that the majority of drums encountered during Site Investigation were dented, corroded, and/or mangled. Analytical results from Area 1 soil and groundwater samples indicate that releases from the drums have already resulted in the presence of contaminants in the subsurface environment.

Because the drum landfill in Area 1 is located within the fence of the active ACS facility, it has been hypothesized that the pressure on the buried drums from vehicular traffic could result in an additional release of drummed waste to soil, groundwater, soil gas, and ultimately ambient air. This release could then contribute to acute chemical/physical exposures and explosive hazards. It is not possible to quantify the effect of such releases, because drum contents from Area 1 have not been

sampled. Due to the shallow depth to groundwater (i.e., approximately two feet below ground surface), any additional waste released from the drums is likely to be below the groundwater table. As such, if drum damage were to occur from truck traffic, releases could potentially increase the total amount of waste present in subsurface soil and groundwater, and are likely to cause a sudden increase in air concentrations that could pose an acute risk to workers. Additional investigation may be required in this area to determine the actual risk to workers and/or visitors.

Areas 2 and 3 also contain buried waste and drums that have never been fully characterized. During a site visit in 1998, BVSPC noted that the protective clay cap over Area 2 had eroded in many areas, allowing drums to be exposed (BVSPC 1998a). While Areas 2 and 3 are not within the active facility; a risk of acute exposure or explosion from vehicular puncture of these drums does exist anytime vehicles are in these areas. In order to quantitatively estimate the risk associated with these exposures in these areas, further investigation would be required.

## 6.0 Uncertainty Analysis

Risk is a function of exposure and toxicity. Therefore, uncertainties in estimating either exposure or toxicity can lead to uncertainties in evaluating potential risks. As discussed, conservative assumptions and approaches have been systematically applied in the risk assessment to address uncertainties. Use of these conservative assumptions and approaches means that risks are likely to be overestimated rather than underestimated in this RA. Several key sources of uncertainty in the risk estimates are described in the following sections.

### 6.1 Site Characterization

Chemical concentrations in soil, groundwater, surface water, sediment, and air are generally heterogeneous, with concentrations varying from one location to another, and over time.

In the attempt to conservatively estimate the true mean of each exposure medium, the 95% upper confidence limit (UCL) of the arithmetic mean for each contaminant (or the maximum measured concentration, whichever is lower), was used to estimate exposures. These estimated exposure concentrations may overestimate or underestimate risks for the following reasons (ENVIRON 1998):

- It is not possible to guarantee that the highest concentration at a Site will be detected during any sampling event. However, targeted sampling conducted at the Site has generally focused on identifying areas of contamination, rather than specifically characterizing areas of exposure. For example, many of the soil samples selected for analysis were those with the highest contamination based on visual observation and total organic vapor readings. Therefore, the exposure concentrations used in the risk assessment may be higher than the actual average concentrations.
- The use of the 95 UCL may, in some cases, underestimate the actual risk to a specific receptor. For example, the case of a receptor whose activities do not result in an equal opportunity for exposure with every part of the site, but instead has repeated exposure with a small part of the site where maximum contaminant concentrations are present. The use of an estimate of the mean contaminant concentration (e.g., 95 UCL) would underestimate the risk to this receptor.
- Contaminant concentrations in various media are assumed to remain constant over time, which could underestimate or overestimate risks by not accounting for degradation. Site contaminants may degrade to chemicals with more or less toxicity. For example, some chlorinated solvents found at the Site (e.g., tetrachloroethene,



trichloroethene, dichloroethene) may degrade to vinyl chloride, which may be more hazardous than the parent compounds. However, the most frequently detected solvent, benzene, would degrade to less toxic substances such as carbon dioxide and water. Sampling and analysis were performed in soil, groundwater, sediment, and surface water at the ACS Site for common degradation products, such as vinyl chloride. These degradation products have been included in the risk assessment.

- Vinyl chloride has the potential to migrate from landfills through soil gas into indoor residential basements. Vinyl chloride has been detected in two off-site upper aquifer monitoring wells, one north of the Site at a concentration below the MCL (in MW-39), and one just southeast of the Site at concentrations at or just above the MCL (in MW-6). The soil gas migration of vinyl chloride or other volatiles has not been evaluated at the ACS site. This is a potential source of risk and is an additional reason why volatiles in the upper aquifer should be contained onsite.
- Contaminant concentrations in various media are assumed to remain constant over time, which could overestimate risks by not accounting for source depletion. The assumption of steady-state conditions could also underestimate exposure concentrations by not accounting for future release of unmitigated source materials, "if such a release is significantly greater than those that have occurred over the past three decades at the Site. Intact buried drums on-site that still contain waste material are a potential source at the Site. As these drums degrade, or are disturbed during potential excavation activities, the waste material may be released to the environment. An attempt was made in Area 2 to puncture or crush the 35,000 to 50,000 drums prior to burial. These drums, having been buried for 20 to 40 years, are now in various states of corrosion. This would suggest that contaminant concentrations in soil and groundwater may already represent the impact of the drums as a source (i.e., exposure concentrations are not likely to be higher in the future than the concentrations measured to date). However, past USEPA observations suggest the possibility that some intact drums, full of waste solvents, may have yet to release their contents. Therefore, further sampling is needed to fully characterize the risks in Area 2.

Drums in Area 1 are also in varying states of degradation. However, since many of these drums were not intentionally breached prior to disposal, a potentially greater fraction of the drums in Area 1 may still hold waste material that could be released in the future. Thus, chemical concentrations in soil and groundwater in Area 1 could conceivably increase in the future as a result of continuing release from drums in that Area (ENVIRON 1998).

## 6.2 Tentatively Identified Compounds

Organic compounds are initially identified in analyses by gas chromatography-mass spectroscopy (GC/MS) via computerized searching of the sample mass spectrum against compound libraries through retention time and retention index matching (EPA, 1990). Tentatively identified compounds (TIC) are those organic analytes that are not treated as target compounds when the identification of the analyte is based on this computerized search. The confidence in identification of the analyte is uncertain; however, can be increased by reanalyzing the sample using the corresponding standard to calibrate the equipment. When reanalysis does not occur, as indicated by the ACS site data, the identity of the TIC remains uncertain and the concentration can only be estimated.

Over 600 TICs were detected in the organic fraction of the soil, groundwater, sediment, and surface water samples collected at the ACS site. Many of the compounds that appear as TICs belong to common organic compound classes. The most frequently detected TICs in soil and surface water were in the hydrocarbon and aromatic hydrocarbon compound classes. The most frequently detected TICs in groundwater were in the ether compound class. The most frequently detected TICs in sediment belong to the phenol and hydrocarbon compound classes. Additional TICs detected in the samples belong to the aldehyde and alcohol compound classes.

Although over 600 TICs were detected at the ACS site, the risk associated with exposure to the large number of compounds could not be calculated. Critical toxicity values necessary to calculate risk from exposure to the compounds were not available for any of the TICs, except for the following 13 analytes: acetaldehyde, acetophenone, azobenzene, 1-butanol, caprolactam, chlorodifluoromethane, cyclohexanone, diethylether, 1,4-dioxane, 2-(2-butoxyethoxy)ethanol, hexane, 4,4'-(1-methylethylidene)phenol, and phthalic anhydride.

Because quantitative estimates for only 13 TICs were included in the HHRA, high levels of uncertainty remains relative to the risk associated with the over 600 contaminants. The samples were not reanalyzed using the corresponding standards and the identities and concentrations of the TICs are uncertain. Therefore, because of this minimal evaluation that was performed for the TICs detected at the ACS site, it cannot be determined whether the presence of these 600 plus contaminants would pose a significant risk to receptors if exposure were to occur either singly or in combination with the multitude of other contaminants at the ACS site.

## 6.3 Exposure Scenarios and Behavior Patterns

Scenarios of human exposure were evaluated without attempting to quantify the likelihood with which those scenarios may occur. For example, the likelihood of construction on the off-site Containment Area landfill (Area 2) is not known, and has not been accounted for in the calculation of potential health risks (i.e., the risks were calculated assuming that such construction will occur). In addition, the behavioral patterns of workers, trespassers, and residents also cannot be predicted with certainty. Section 3.4 identifies assumptions that are applied to characterize behavior (e.g., exposure frequencies) and physical traits (e.g., body weight). RME, as well as central tendency estimates were evaluated to help characterize the uncertainty and variability among potential receptors and their behavior. There is only a small probability that any individual would experience RME exposures, but, consistent with USEPA guidance, these values are evaluated in order to be adequately conservative.

Blood lead concentrations may be underestimated in this risk assessment due to the limitations of the models used. These models do not account for Pica behavior (high end exposure of individuals documented to eat soil). In addition, the model is based upon total soil lead concentrations. Soil lead concentrations have been shown to increase in the fine fraction (i.e., less than 250 microns). This fine fraction is the portion which would stick to hands and be available for incidental ingestion. The ingested soil lead concentration (concentration in the fine fraction) is likely to be 2 to 3 times greater than the total soil lead concentration. The increase in lead concentrations available for human incidental ingestion is not accounted for in this risk assessment.

**6.3.1 Exposure to Maximum Soil Concentrations.** The exposure activity patterns of the receptor populations cannot be known with certainty. Biased exposures can occur because of non-random activity patterns. If there is a feature at the Site that draws receptors to a particular location in an area, and that location happens to have higher concentrations than the rest of the area, then exposures could be greater than those estimated using the upper confidence limit on the mean of concentrations throughout an area. Concentrations at the Site are very heterogeneous, with the highest concentrations of a given chemical and nondetected concentrations of the same chemical within several feet of each other.

### 6.3.2 Dermal Soil Loading and Fraction Absorbed

Risks and hazard indices were calculated for dermal exposures to soil/sediment for all receptors using dermal adherence values recommended by USEPA's Dermal Exposure Assessment Guidance (USEPA 1992f), the only promulgated USEPA guidance for dermal

assessment. Other adherence values found in USEPA's *Region 9 Preliminary Remediation Goals (PRGs) 1998* (USEPA 1998c) and presented in the USEPA Interim Guidance *Dermal Risk Assessment* (USEPA 1998d) were not used, but are presented here for comparative value. The interim adherence values were not used because they have not been approved for use in risk assessment. Adherence values estimate the amount of soil that will adhere to a given surface area of skin. The 1998 adherence values are based on several recent studies in the literature (Kissel et al. 1996a, 1996b) and are lower than adherence values recommended in USEPA guidance (USEPA 1992f):

<b>Comparison of Dermal Adherence Values</b>		
<b>Receptor</b>	<b>USEPA (1992f)</b>	<b>USEPA (1998c, 1998d)</b>
Adult	1.0 (RME). 0.2 (central)	0.08
Child	1.0 (RME). 0.2 (central)	0.3

The current *Exposure Factors Handbook* (USEPA 1997c) indicates that confidence in the USEPA (1992f) adherence factors is low. USEPA (1997c) cites Kissel et al. studies (1996a 1996b) as more recent studies for estimation of dermal adherence, although the overall rating of these studies is also low (due to the limited dataset and differing exposure settings, e.g., some participants wore gloves and others didn't). The Kissel data indicate that there is high variability in soil adherence depending on several factors including the activity of the receptor, soil type, and soil moisture content.

The percentage of chemical in soil that is absorbed through the skin (i.e., the fraction absorbed) is influenced by the amount of soil that adheres to the skin. USEPA (1992f) notes that the fraction absorbed is likely to be greatest when the amount of soil on the skin is a "monolayer" (defined as a single layer of tightly packed particles). When soil adherence on the skin is greater than a monolayer, the fraction absorbed decreases as the thickness of the soil layer on the skin increases because soil particles are not in contact with the skin. Thus, absorption through the skin is expected to decrease at high levels of soil adherence. The fraction absorbed also decreases when soil adherence is low enough that the skin is not completely covered with soil particles. The potential sensitivity of the fraction absorbed to soil adherence is of particular concern with the significant uncertainty in soil adherence values.

## 6.4 Toxicological Information

Toxicity data used in risk assessment is limited. Much of the USEPA data used to generate health criteria are derived from animal studies. The following uncertainties result from the USEPA toxicological database:

- Both end-points of toxicity (effect or target organ) and the doses at which effects are observed are extrapolated from animals to humans
- Results of short-term exposure studies are used to predict the effects of long-term exposures
- Results of studies using high doses are used to predict effects from exposures to low doses typically associated with environmental exposures
- Effects exhibited by homogeneous populations of animals (or humans) are used to predict effects in heterogeneous populations with variable sensitivities
- Current toxicity values are based upon adult exposures and have not been evaluated for their protectiveness to children or the developing fetus

In evaluating the potential for noncancer hazards, USEPA attempts to account for these sources of uncertainty by using a conservative approach to develop toxicity values. First, the highest dose that caused no adverse effect in the study animals (NOAEL) (or the lowest dose that caused an adverse effect, LOAEL, if no NOAEL is available) is selected. This dose is then divided by one or more uncertainty factors. For example, an uncertainty factor of ten is typically applied to account for each of the following: (1) use of a LOAEL instead of a NOAEL; (2) estimation of long-term effects from a short-term study; (3) extrapolation from animals to humans; and (4) variability among individual humans, so that the RfD or RfC will be protective of sensitive individuals in the general population. Finally, a modifying factor of up to ten is sometimes applied to USEPA. Thus the RfD or RfC can be up to 1,000 times lower than a dose which caused no effect in animals, and up to 10,000 times lower than the lowest dose shown to have an adverse effect.

In evaluating the potential for cancer, current methodology assumes that there is no threshold dose below which the risk of developing cancer is zero. Therefore, mathematical models (e.g., the linearized multi-stage low-dose extrapolation model) are used to estimate the risks associated with very low doses. The data are fit to the model and the upper 95 percent confidence limit of the slope is calculated, i.e., the slope factor; thus, there is only a 5 percent chance that the probability of response could be greater. The true value of cancer risk of these chemicals is uncertain; it is unlikely to be lower than the values estimated.

#### **6.4.1 Extrapolated Dermal Toxicity Values**

As noted in Section 4, USEPA has not established any toxicity values for evaluating risks or hazards via the dermal route. The extrapolation of toxicity values from one route to another introduces significant uncertainties because the toxicity of a chemical may differ from one route of exposure to another. Use of oral toxicity values to estimate dermal risks could overestimate risks if the mechanism of oral toxicity for a chemical were influenced by first-pass metabolism in the intestine and liver (e.g., when toxicity is caused by metabolites of the contaminant). Chemicals absorbed through the skin are distributed through the body without undergoing this presystemic transformation to the more toxic metabolite. Use of oral toxicity values to estimate dermal risks could also underestimate risks if oral absorption in the toxicity study were significantly less than 100%, and the oral toxicity value did not account for oral absorption. In addition, chemicals such as PCBs may cause the toxic effect at the point of contact rather than (or in addition to) effects on internal organs after being absorbed through the skin. For chemicals that act in this manner, combination of a dermal absorption fraction with the estimated toxicity value may underestimate risks to the skin itself.

### **6.5 Cumulative Risks**

The summation of cancer risks and noncancer hazards for multiple contaminants is based on dose additivity, which assumes that there are no synergistic or antagonistic interactions among the contaminants in a mixture and that each contaminant has the same mode of action and elicits the same health-effects (USEPA 1989). The cumulative estimates are considered screening-level estimates because they tend to overestimate cumulative cancer risks and noncancer hazards.

For example, the estimate of cumulative cancer risk is a sum of upper bound estimates of cancer risk, which are calculated with slope factors representing upper 95% confidence bounds of cancer potency. Contaminants with lesser evidence of human carcinogenicity are treated the same as contaminants with greater evidence (i.e., USEPA weight-of-evidence Groups B and C carcinogens are given the same weight as Group A carcinogens). Group C carcinogens contributed less than 2 percent of the total cancer risk. Similarly, contaminants with RfDs of lower confidence (i.e., larger uncertainty factors) are treated the same as contaminants with RfDs of higher confidence. The estimates of HIs presented in this baseline risk assessment include contaminants that may induce different health effects or that may act by different mechanisms.

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## **Chemical-Specific Toxicity Assessments for Chemicals of Concern**

### **Health Effects of Chemicals of Concern**

This subsection contains chemical-specific information on the adverse health effects that are caused by each chemical of concern at the American Chemical Services site.

#### **Acetone**

Acetone is a commonly used solvent, which probably is not very persistent in the environment. It is considered to have rather low toxicity, and no chronic health hazards have been associated with exposure to it. Acetone is not very toxic to aquatic organisms. (Clement Associates)

Limited human studies have shown that workers exposed to acetone vapors (600 to 2,150 ppm) experienced transient eye and nose irritation. Animals exposed to acetone vapors at 45,134 mg/cu.m experienced slight, but not significant, decreases in organ and body weights. A study by the EPA (1986) showed increased liver and kidney weights and nephrotoxicity. Acetone was administered by gavage for 90 days to groups of albino rats (30/sex/group) at 0, 100, 500, or 2,500 mg/kg/day. Statistical analysis of the absolute and relative organ weight data revealed significantly increased kidney weights for females in the 500 and 2,500 mg/kg/day groups and increased kidney-to-body and brain weight ratios for males and females in the 2,500 mg/kg/day groups. Liver weight and liver/body weight ratios were also increased in the 2,500 mg/kg/day males and females. Histopathologic studies revealed a marked increase in severity in tubular degeneration of the kidneys and hyaline droplet accumulation with increasing doses.

Acetone has a D classification--not classifiable as to human carcinogenicity, based on lack of data concerning carcinogenicity in humans or animals. (IRIS)

#### **Aldrin**

Aldrin is an organochlorine insecticide also known as HHDN, Octalene, and Aldrec. Pure Aldrin is a colorless crystalline solid and a 95% mixture is tan to dark brown. 27 micrograms of Aldrin will dissolve in one liter of water, making it very insoluble (ATSDR 1988).

The health effects as related to the noncarcinogenic effects of aldrin are demonstrated by Fitzhugh, et al., (1964). Rats were fed aldrin at levels of 0 to 150 ppm for two years. Liver lesions characteristic of chlorinated insecticide poisoning were observed at dose levels of 0.5 ppm and greater. A statistically significant increase in liver-to-body weight ratio was observed at all dose levels (IRIS 1987).



Regarding the carcinogenic effects of aldrin, human carcinogenicity data are inadequate for evidence of aldrin being a human carcinogen. Animal studies, however, are sufficient to classify aldrin as a probable human carcinogen or group B2.

Orally administered aldrin produced significant increases in tumor responses in three different strains of mice in both males and females. Tumor induction has been observed for structurally related chemicals, including dieldrin, a metabolite.

### **Ammonia**

Ammonia is a colorless gas with a very sharp odor. Ammonia easily dissolves in water, where it changes to ammonium, which is not a gas and does not smell. Eighty percent of all man-made ammonia is used as fertilizer. Ammonia is also used to manufacture synthetic fibers, plastics and explosives. Many cleaning products also contain ammonia. Ammonia does not last very long in the environment. In soil or water, plants and microorganisms rapidly take up ammonia. In the air, ammonia will last about a week. (ATSDR)

Holness et al (1989) investigated production workers exposed to ammonia in a soda ash facility. Since the study was cross-sectional in design with a small population, it is possible that selection bias may have occurred. Therefore the critical effects include decreased pulmonary function or changes in subjective symptomatology could not be established. Broderson et al (1976) exposed groups of F344 rats continuously to 25, 50, 150, or 250 ppm ammonia for 7 days prior to inoculation and from 28-42 days after. All levels of ammonia, whether produced naturally or derived from a purified source, significantly increased the severity of rhinitis, otitis media and a pneumonia. Furthermore, there was a significant concentration response between observed respiratory lesions and increasing environmental ammonia concentration for gross and microscopic lesions.

This substance has not undergone a complete carcinogenic evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

### **Antimony**

Antimony is a naturally occurring metal that is used in various manufacturing processes. It exists in valence states of 3 and 5 (Budavari, 1989; ATSDR, 1990). Antimony is transported in the blood, its distribution varying among species and dependent on its valence state (Felicetti et al., 1974b). It is not metabolized but may bind to macromolecules and react covalently with sulfhydryl and phosphate groups (ATSDR, 1990).

Acute oral exposure of humans and animals to high doses of antimony or antimony-containing compounds (antimonials) may cause gastrointestinal disorders (vomiting, diarrhea), respiratory

difficulties, and death at extremely high doses (Bradley and Frederick, 1941; Beliles, 1979; ATSDR, 1990). Subchronic and chronic oral exposure may affect hematologic parameters (ATSDR, 1990). Long-term exposure to high doses of antimony or antimonials has been shown to adversely affect longevity in animals (Schroeder et al., 1970). Limited data suggest that prenatal and postnatal exposure of rats to antimony interferes with vasomotor responses (Marmo et al., 1987; Rossi et al., 1987).

Acute inhalation exposure of humans may cause gastrointestinal disorders (probably due to ingestion of airborne antimony) (ATSDR, 1990). Long-term occupational exposure of humans has resulted in electrocardiac disorders, respiratory disorders, and possibly increased mortality (Renes, 1953; Breiger et al., 1954). Antimony levels for these occupational exposure evaluations ranged from 2.2 to 11.98 mg Sb/m<sup>3</sup>. Based on limited data, occupational exposure of women to metallic antimony and several antimonials has reportedly caused alterations in the menstrual cycle and an increased incidence of spontaneous abortions (Belyaeva, 1967).

No data were available indicating that dermal exposure of humans to antimony or its compounds results in adverse effects. However dermal application of high doses of antimony oxide (1,584 mg Sb/kg) resulted in the death of rabbits within one day (IBTL, 1972). Eye irritation due to exposure to stibine gas and several antimony oxides has been reported for humans (Stevenson, 1965; Potkonjak and Pavlovich, 1983).

#### **Aroclor - 1242**

Arochlor 1242 is a synonym for polychlorinated biphenyls (PCBs—see below).

#### **Aroclor 1248**

In general, Rhesus monkeys have shown adverse effects to PCB mixtures at doses 10-fold lower than in other species. Schantz et al. (1989) evaluated neurobehavioral performance in offspring of rhesus monkeys that had been exposed to 0.03, 0.1 and 0.2 mg/kg-day of dietary Aroclor 1248 for different durations. Mild dermatological lesions and hyperpigmentation about the hairline developed in offspring in all the treated groups during nursing, but no signs of toxicity were evident at the time of neurological testing (age 14 months). Necropsy of the infants who died showed signs of PCB intoxication that included thymic atrophy and skin hyperpigmentation. Offspring weights at birth and weaning were significantly reduced in Group III (0.2 mg/kg-day). Decreased performance on a shape discrimination problem was observed in Group III when irrelevant cues were inserted.

This substance has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

### **Aroclor 1254**

Human data available for risk assessment of Aroclor 1254 are useful only in a qualitative manner. Studies of the general population who were exposed to PCBs by consumption of contaminated food, particularly neurobehavioral evaluations of infants exposed in utero and/or through lactation, have been reported, but the original PCB mixtures, exposure levels and other details of exposure are not known. Most of the information on health effects of PCB mixtures in humans is available from studies of occupation exposure. Some of these studies examined workers who had some occupational exposure to Aroclor 1254, but sequential or concurrent exposure to other Aroclor mixtures nearly always occurred, exposure involved dermal as well as inhalation routes (relative contribution by each route not known), and monitoring data are lacking or inadequate. Insufficient data are available in these studies to determine possible contributions of Aroclor 1254 alone, extent of direct skin exposure and possible contaminants. However, it is relevant to note that dermal and ocular effects, including skin irritation, chloracne, hyperpigmentation and eyelid and conjunctival irritation, have been observed in humans occupationally exposed to Aroclor 1254 and other Aroclor formulas. This substance has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

There is a range of noncarcinogenic health effects. Monkeys that ingested 0.005-0.08 mg/kg-day doses of Aroclor 1254 showed ocular exudate, prominence and inflammation of the Meibomian glands and distortion in nail bed formation. These changes were seen at the lowest dose tested, 0.005 mg/kg-day, and a dose-dependent response was demonstrated. Similar changes have been documented in humans for accidental oral ingestion of PCBs.

### **Aroclor 1260**

Aroclor 1260 is a synonym for polychlorinated hydrocarbons (PCBs—see below).

### **Arsenic**

Arsenic is a naturally-occurring metalloid element. Pure arsenic is not commonly found in the environment. It is usually found combined with one or more other elements, such as oxygen, chlorine, or sulphur. Arsenic combined with these elements is referred to as inorganic arsenic, while arsenic combined with carbon and hydrogen is referred to as organic arsenic. The organic arsenic forms are usually less toxic than the inorganic forms.

The results of human studies indicate that doses as low as 20 to 60 ug/kg/day may produce the characteristic signs of arsenic toxicity, including gastrointestinal irritation, anemia, neuropathy, skin lesions, vascular lesions, and lipidic or renal injury. There does not appear to be a strong trend toward cumulative toxicity because doses of about 50 ug/kg/day produce similar effects after both short and long-term exposure. In most cases of subchronic or chronic exposure, many or all of the

signs of arsenic toxicity are detected together, indicating systemic end points are similar. Doses of about 10 ug/kg/day do not generally cause measurable signs of arsenic intoxication.

Many reports indicate that dermal exposure to inorganic arsenic compounds leads to dermatitis. However, none of these reports provides quantitative information on dose-duration relationships.

Arsenic is classified as a known carcinogen (Category A) under the Risk Assessment Guidelines of 1986. Studies have indicated that skin cancer prevalence is proportional to arsenic exposure level. Other studies show the same results, with increased frequency of skin cancer or internal cancer in individuals exposed to water containing 0.3 mg/l or more. Failure to detect significant increases at lower doses may be due to lack of statistical power in the studies, or it could suggest that arsenic-induced cancers have a threshold dose.

Many studies report above-average lung cancer rates in groups of people with above-average exposure to airborne arsenic. It has been concluded that arsenic is a more potent lung carcinogen than previously believed, with a dose-response relationship concave downward at exposure levels below 10,000 ug/m<sup>3</sup>/year. The relationship between lung cancer and urinary arsenic levels was linear, suggesting that bioavailability and lung absorption of arsenic tend to be proportionately greater at low exposure levels than at high exposure levels.

EPA has established a maximum contaminant level (MCL) of 0.05 mg/L for arsenic.

## **Barium**

Barium is a silvery white metallic element which oxidizes very easily. It is one of the less expensive metals that have the distinctive properties of absorbing gases. It belongs to the alkaline earth group, resembling calcium chemically. The most important compounds are peroxide, chloride, sulfate, carbonate, nitrate, and chlorate. Traces of barium are very widely distributed.

Compounds of barium can be highly toxic. The fatal dose of BaCl<sub>2</sub> for man is reported to be between 0.8 and 0.9 g (0.55 to 0.6 g as Ba).

Soluble barium compounds are very toxic to humans after exposure by inhalation or ingestion. The greatest effect of barium poisoning is a strong, prolonged stimulant action on muscle. Effects on the hematopoietic system and cerebral cortex of humans have also been reported. Inhalation of barium sulfate dust, barium oxide dust, and barium carbonate gives rise to baritosis, a benign pneumoconiosis and occupational disease.

Baritosis was first described in Italy. Baritosis was later reported in the United States in barium miners by Pendergrass Leopold, in Germany, and in Czechoslovakia. Baritosis also occurred among workers handling lithopone. Baritosis causes no specific symptoms and no changes in pulmonary function.

Brenniman, et al., concluded that there was no statistically significant difference in blood pressure between humans ingesting drinking water containing barium at 7.3 mg/L compared with 0.1 mg/L. A concentration of 7.3 mg/L corresponds to a dose of 0.20 mg/kg/day (assuming that a 70-kg adult drinks 2 L/day).

Perry, et al., exposed weaning rats to barium at 1, 10, or 100 ppm in drinking water for up to 16 months (average daily barium doses of 0.051, 0.51, and 5.1 mg/kg, respectively). There were no signs of toxicity at any barium dose level. Systolic blood pressure measurements revealed no increase in pressure in animals exposed to 1 ppm barium for 16 months, an increase of 4 mm Hg ( $p < 0.01$ ) in animals exposed to 10 ppm barium for 16 months, and an increase of 16 mm Hg ( $p < 0.001$ ) in animals exposed to 100 ppm barium for 16 months. The animals in this study were maintained in a special contaminant-free environment and fed a diet designed to reduce exposure to trace metals. It is possible that the restricted intake of certain beneficial metals (e.g., calcium and potassium) may have predisposed the test animals to the hypertensive effects of barium.

No evidence of the carcinogenicity of barium could be located in the literature.

EPA has established an MCL of 2 mg/L for barium.

## **Benzene**

Benzene is an important industrial solvent and chemical intermediate. It is rather volatile, and atmospheric photooxidation is probably the most important fate process. Benzene is a known human carcinogen, causing leukemia in exposed individuals. It also adversely affects the hematopoietic system. Benzene has been shown to be fetotoxic and to cause embryolethality in experimental animals. Exposure to high concentrations of benzene in the air causes central nervous system depression and cardiovascular effects, and dermal exposure may cause dermatitis.

Acute inhalation exposure to benzene at concentrations from 50 to 3,000 ppm results in a range of effects on the nervous system, depending on level and duration. Common signs include dizziness, nausea, headache, sleepiness, and loss of coordination. These effects are generally fully reversible, although exposure to a very high level (20,000 ppm) can induce coma and even cause death. Long-term exposure to lower levels of benzene can injure the hematopoietic (blood forming) system. Pancytopenia, aplastic anemia, and other abnormalities of blood cells have been reported to occur more

frequently in groups of workers exposed to benzene in the workplace at levels perhaps as low as 20 to 30ppm. (Goldwater, Aksoy, and Goldstein). Similar blood dyscrasia have been reported in many animal studies of inhalation exposure to levels of around 100 ppm or higher or oral doses of 50 to 500 mg/kg/day (Wolfe, 1956; NTP, 1986a). Abnormalities in the immune system have also been detected in humans and animals exposed to benzene (ATSDR 1987). (App A)

Benzene is classified as a known human carcinogen (Category A) under the Risk Assessment Guidelines of 1986. Under the proposed revised Carcinogen Risk Assessment Guidelines (USEPA, 1996), Benzene is characterized as a known human carcinogen for all routes of exposure based upon convincing evidence as well as supporting evidence from animal studies. Epidemiologic studies and case studies provide clear evidence of a causal association between exposure to benzene and acute nonlymphocytic leukemia (ANLL) and also suggest evidence for chronic nonlymphocytic leukemia (CNLL). Other neoplastic conditions that are associated with an increased risk in humans are hematologic neoplasms, blood disorders such as preleukemia and aplastic anemia, Hodgkin's lymphoma, and myelodysplastic syndrome (MDS). These human data are supported by animal studies. The experimental animal data add to the argument that exposure to benzene increases the risk of cancer in multiple species at multiple organ sites (hematopoietic, oral and nasal, liver, forestomach, preputial gland, lung, ovary, and mammary gland). It is likely that these responses are due to interactions of the metabolites of benzene with DNA. Recent evidence supports the viewpoint that there are likely multiple mechanistic pathways leading to cancer and, in particular, to leukemogenesis from exposure to benzene. (IRIS)

## **Beryllium**

Beryllium, one of the lightest of metals, is widely distributed geographically, and has found wide application in industry. Some features that have contributed to its wide use in industry are that it is a stable lightweight metal with a high melting point, it has a high strength to weight ratio, and it imparts resistance to corrosion, vibration, and shock when alloyed with other metals.

Beryllium usually exists in nature as a compound. Bextrandixe and beryl ores are used commercially for obtaining beryllium. Beryllium is also found in coal and gasoline. Common forms of beryllium are beryllium oxide, fluoride, and hydroxide.

Although beryllium is a naturally-occurring substance, the major source of its emission to air is the combustion of coal and fuel oil, which releases particulates and fly ash containing beryllium into the atmosphere. The average concentration of beryllium in coal is 1.8 - 2.2 micrograms per gram. Fuel oil can contain 0.08 ppm beryllium. The beryllium released from coal combustion is likely to be in the form of beryllium oxide. Beryllium oxide is relatively insoluble and would not be mobilized in soil or surface water at normal pH ranges. It is believed that most environmental beryllium is present

in an insoluble form. This is substantiated by empirical data which indicate that even in polluted rivers, dissolved beryllium levels are very low. In most types of soils, beryllium is expected to be tightly adsorbed because it displaces divalent cations which share common adsorption sites. Removal of beryllium from the atmosphere results from wet and dry deposition. No evidence was found that any environmental process results in the volatilization of beryllium into the atmosphere from water or soil.

Exposure to beryllium may lead to certain toxic effects, such as cellular necrosis. Schroeder and Mitchner (1975) orally administered beryllium (as beryllium sulfate) to rats at dose levels of 0 and 0.54 mg/kg/day. The exposure was for a lifetime, after which the rats were observed for changes in the heart, kidney, liver, and spleen. There were no effects of treatment on these organs nor on the number of tumors, the life span, urinalysis, serum glucose, cholesterol, and uric acid.

Occupational exposure to beryllium may lead to beryllium sensitization and progression to chronic beryllium diseases. Chronic beryllium disease is a chronic inflammatory lung lesion that can result from inhalation exposure to beryllium. Short-term human and animal exposures to high levels of beryllium leads to development of inflammation or reddening and swelling of the lungs (similar to pneumonia). A skin allergy has been shown to develop when beryllium comes in contact with the skin.

Beryllium is classified as a probable human carcinogen (Category B2), based on limited evidence of carcinogenicity in humans exposed to airborne beryllium (lung cancer) and sufficient evidence of carcinogenicity in animals.

EPA has established an MCL of 0.004 mg/L for beryllium.

### **Bis (2-chloroethyl) ether**

Bis (2-chloroethyl) ether was used in the past as a soil fumigant and is now used as a solvent and chemical reagent. It is fairly soluble in water and is probably moderately persistent in the environment. It caused an increased incidence of liver tumors in male mice following oral administration, and it was found to be mutagenic using the Ames assay. In the air, it is irritating to the eyes and nasal passages and when inhaled can damage the lungs, liver, kidneys and brain. (Clement Associates)

There is little information available concerning the environmental transport and fate of bis (2-chloroethyl) ether and the relative importance of the various transport and fate processes. Some volatilization of this compound from aquatic and terrestrial systems, and subsequent atmospheric transport probably can occur. Because it is somewhat soluble in water, bis (2-chloroethyl) ether can migrate through the soil. Direct photolysis is not expected to take place in the atmosphere or in surface

waters. However photooxidation of the bis(2-chloroethyl) ether that reaches the troposphere is likely to occur. Slow hydrolytic cleavage of the carbon-chlorine bonds can occur and is probably the most important aquatic fate. Adsorption on particulate matter does not appear to be a significant environmental transport process. A limited amount of indirect evidence suggests that bis(2-chloroethyl) ether has little potential for bioaccumulation. Available information is not adequate to characterize the importance of biodegradation as a fate process. It is reported that significant degradation can occur in aquatic systems after a period of acclimation.

Bis (2-chloroethyl) ether has a B2 classification--probable human carcinogen based on positive carcinogenicity results in two strains of mice and evidence of mutagenicity.(IRIS)

### **Bis (2-ethylhexyl) phthalate**

Bis (2-ethylhexyl) phthalate, is a phthalate ester also known as DEHP, dioctyl phthalate, di-n-butylphthalate, and octoil. Bis (2-ethylhexyl) phthalate is a non-volatile, colorless liquid, only slightly soluble in water. It is widely used as a plasticizer for polyvinyl chloride and other polymers and is likely to be released to air and water during production and waste disposal of these plastic products. Bis (2-ethylhexyl) phthalate will be carried long distances and be removed by rain. Carpenter et al (1953) conducted chronic oral toxicity studies on rats, guinea pigs, and dogs. The guinea pigs were fed diets containing bis(2-ethylhexyl) phthalate for a period of one year at levels corresponding to 19 and 64 mg/kg/day. Significant increases were observed in relative liver weights in both treated groups. Groups of rats were maintained for 2 years on diets containing bis(2-ethylhexyl) phthalate. The results of this study demonstrated that guinea pigs offer the most sensitive animal model. (App A)

There is inadequate human carcinogenicity data for bis(2-ethylhexyl) phthalate. A mortality study conducted by Thiess et al (1978) was limited by a short follow-up period and unquantified bis (2-ethylhexyl) phthalate worker exposure. In a NTP (1982) study, rats and mice were fed diets containing bis(2-ethylhexyl) phthalate for 102 weeks. A statistically significant increase in the incidence of hepatocellular carcinomas and combined incidence of carcinomas and adenomas were observed in female rats and both sexes of the mice. Based on a significant oral dose related increase in liver tumor responses in rats and mice, USEPA classified bis(2-ethylhexyl) phthalate as B2-probably human carcinogen. (IRIS)

### **Cadmium**

Cadmium is a silver-blue-white metal. Pure metallic cadmium is not common in the environment. It is most often encountered in combination with other elements such as oxygen, chlorine, and sulfur. Metallic cadmium has a low melting point for metal and is insoluble in water.



U.S. EPA conducted a toxicokinetic model to determine the highest level of exposure associated with a lack of proteinuria of the human renal cortex (i.e., the critical effect).

Human epidemiological studies of cadmium smelter workers supply limited evidence of human studies human lung carcinogenicity. The study by Thun et al. (1985) was reported by the U.S. EPA Carcinogen Assessment Group as not adequately accounting for the possibilities of confounding factors due to the presence of arsenic or to smoking. Other studies have linked cadmium with prostate cancer, and again lung cancer; however, these studies also did not take the presence of other carcinogens into effect.

### **Chloroform**

Chloroform is a colorless, volatile liquid that is widely used as a general solvent and as an intermediate in the production of refrigerants, plastics, and pharmaceuticals (Torkelson and Rowe, 1976; IARC, 1976). Chloroform is rapidly absorbed from the lungs and the gastrointestinal tract, and to some extent through the skin. It is extensively metabolized in the body, with carbon dioxide as the major end product. The primary sites of metabolism are the liver and kidneys. Excretion of chloroform occurs primarily via the lungs, either as unchanged chloroform or as carbon dioxide (ATSDR, 1989).

Target organs for chloroform toxicity are the liver, kidneys, and central nervous system. Liver effects (hepatomegaly, fatty liver, and hepatitis) were observed in individuals occupationally exposed to chloroform (Bomski et al., 1967). Several subchronic and chronic studies by the oral or inhalation routes of exposure documented hepatotoxic effects in rats, mice, and dogs (Palmer et al., 1979; Munson et al., 1979; Heywood et al., 1979). Renal effects were reported in rats and mice following oral and inhalation exposures (Roe et al., 1979; Reuber, 1976; Torkelson et al., 1976), but evidence for chloroform-induced renal toxicity in humans is sparse. Chloroform is a central nervous system depressant, inducing narcosis and anesthesia at high concentrations. Lower concentrations may cause irritability, lassitude, depression, gastrointestinal symptoms, and frequent and burning urination (ATSDR, 1989).

Developmental toxicity studies with rodents indicate that inhaled and orally administered chloroform is toxic to dams and fetuses. Possible teratogenic effects were reported in rats and mice exposed to chloroform by inhalation (Schwetz et al., 1974; Murray et al., 1979). Chloroform may cause sperm abnormalities in mice and gonadal atrophy in rats (Palmer et al., 1979; Reuber, 1979; Land et al., 1981).

A Reference Dose (RfD) of 0.01 mg/kg/day for subchronic and chronic oral exposure was calculated from a lowest-observed-adverse-effect level (LOAEL) of 15 mg/kg/day based on fatty cyst formation

in the liver of dogs exposed to chloroform for 7.5 years (Heywood et al., 1979). Development of an inhalation Reference Concentration (RfC) is presently under review (U.S. EPA, 1992b).

Epidemiological studies indicate a possible relationship between exposure to chloroform present in chlorinated drinking water and cancer of the bladder, large intestine, and rectum. Chloroform is one of several contaminants present in drinking water, but it has not been identified as the sole or primary cause of the excess cancer rate (ATSDR, 1989; U.S. EPA, 1985). In animal carcinogenicity studies, positive results included increased incidences of renal epithelial tumors in male rats, hepatocellular carcinomas in male and female mice, and kidney tumors in male mice (Jorgensen et al., 1985; Roe et al., 1979; NCI, 1976).

Based on U.S. EPA guidelines, chloroform was assigned to weight-of-evidence Group B2, probable human carcinogen, on the basis of an increased incidence of several tumor types in rats and in three strains of mice. The carcinogen slope factor ( $q_1^*$ ) for chloroform is  $6.1\text{E-}3$  (mg/kg/day)<sup>-1</sup> for oral exposure (U.S. EPA, 1992b) and  $8.1\text{E-}2$  (μg/m<sup>3</sup>)<sup>-1</sup> for inhalation exposure (U.S. EPA, 1992a). An inhalation unit risk of  $2.3\text{E-}5$  (g/m<sup>3</sup>)<sup>-1</sup> is based on hepatocellular carcinomas in mice in an oral gavage study (U.S. EPA, 1992b).

## **Copper**

Copper is a reddish metal that occurs naturally in rock, soil, water, sediment, and air. Its average concentration in the earth's crust is about 50 parts per million. Copper has the ability to alloy with many metals, such as zinc, tin, and beryllium. Next to copper metal, copper sulfate is the most commercially important use of copper. Copper sulfate is also produced as a by-product of copper production by ore-leaching with sulfuric acid.

There are a number of human cases where they were exposed to levels of copper. For example, cases where the single dose was estimated to be between 0.1 mg/kg and 0.14 mg/kg, symptoms of diarrhea, vomiting, and nausea were common.

High levels of copper can be toxic to humans. Metallic copper dust exposure can cause illness similar to metal fume fever which includes chills, fever, aching muscles, dryness of mouth, and headache. Exposure to copper fumes produces respiratory tract irritation, nausea, metal fume fever, and discoloration of skin and nails. More serious systematic toxic effects include hemolysis, hepatic narcosis, gastrointestinal bleeding, hematuria, proteinuria, convulsions, and death.

Little information exists concerning subchronic toxicity of copper in the usual laboratory species. The one study in the literature that used rats noted an accumulation of copper in the liver and kidney but no accumulation was found in the cornea or brain. No criteria of toxicity was mentioned. Several

studies on pigs revealed accelerated weight gain at doses between 1.8 – 3.2 mg/kg/day. At 5.5 mg/kg/day, reduced growth and hemoglobin levels were noted, as well as increased liver copper concentrations.

## **Chromium**

The ammonium and alkali metal salts of hexavalent chromium are generally water-soluble, but the alkaline metal salts (calcium, strontium) are sparingly soluble or insoluble in water. Hexavalent chromium rarely occurs in nature apart from man-made sources because it is readily reduced in the presence of oxidizable organic matter; however, hexavalent chromium compounds that occur most commonly in the form of chromate and dichromate are stable in many natural waters because of the low concentration of reducing matter. Except acetate and nitrate salts, the trivalent chromium compounds are generally insoluble in water. In most biological systems, chromium is present in the trivalent form. The physical or chemical forms and the mode by which chromium (III) compounds are incorporated into biological systems are poorly characterized.

Chromium occurs naturally in the earth's crust. Continental dust is the primary source of natural chromium present in the environment; however, chromium is released to the environment because of human activities in much larger amounts. Chromium is primarily removed from the atmosphere by fallout and precipitation. Atmospheric chromium removed by physical processes predominantly enters surface water or soil; however, before their removal, chromium particles of aerodynamic diameter less than 20  $\mu\text{m}$  may remain airborne for long periods and may be transported long distances.

Because there are no known chromium compounds that can volatilize from water, transport of chromium from water to the atmosphere is not likely other than by transport in windblown sea sprays. Most of the chromium (III) is eventually expected to precipitate in sediments. Small amounts of chromium (III) may remain in solution as soluble complexes. Chromium (VI) will be present predominantly in soluble form. These soluble forms of chromium may be stable enough to undergo intramedia transport; however, organic matters present in water will eventually reduce chromium (VI) to chromium (III). It has been estimated that the residence time of chromium in lake water is from 4.6 to 18 years.

Chromium probably occurs as insoluble  $\text{Cr}_2\text{O}_3 \cdot \text{H}_2\text{O}$  in soil because the organic matter in soil is expected to convert soluble chromate to insoluble  $\text{Cr}_2\text{O}_3$ . Chromium in soil may be transported to the atmosphere in the aerosol form, and runoff and leaching may transport chromium from soil to surface waters and groundwater. Runoff could remove both soluble and bulk precipitate with final deposition on either a different land area or a water body. Flooding of soils and the subsequent anaerobic decomposition of plant matter may increase mobilization of chromium in soils because of the formation of soluble complexes. The half-life of chromium in soils may be several years.

Chronic oral studies of chromium compounds have not identified any adverse effects on toxicological end points including body and organ weights, clinical chemistry values, and histologic appearance of tissue. Chromium (hexavalent) compounds can cause DNA and chromosome damage in animals and humans. Inhalation of hexavalent chromium salts cause inflammation and irritation of the nasal mucosa, and ulceration and perforation of the nasal septum. Hexavalent chromium also produces kidney damage in humans and animals. Chromium (III), which is less toxic than hexavalent chromium, causes dermatitis in humans upon contact.

Studies indicate that oral chromium (VI) may result in reproductive toxicity. Inhalation exposure has several key effects including respiratory tract effects, irritation of the nasal mucosa; transient decreases in lung function; and induction of cancer. Many cases of nasal mucosal ulceration and perforation have been reported in workers exposed to chromium (VI). Slight effects on lung function have also been observed in exposed workers.

Studies of chromosome effects in lymphocytes of workers exposed to chromium (VI) have given mixed results. In vitro assays for gene mutations, chromosome effects, and cell transformation have consistently given positive results for chromium (VI) and negative results for chromium (III). The positive dominant lethal study considered with positive results in human somatic cells raises concern that chromium (VI) may be a potentially human germ-cell mutagen.

Hexavalent chromium is classified as a known human carcinogen (Category A) by the inhalation route under the Risk Assessment Guidelines of 1986. Carcinogenicity by the oral route of exposure cannot be determined and is classified as Group D.

Applying the criteria for evaluating the overall weight of evidence for carcinogenicity to humans outlined in EPA's guidelines for carcinogen risk assessment (U.S. EPA, 1986), trivalent chromium is most appropriately designated a Group D – Not classified as to its human carcinogenicity. Using the Proposed Guidelines for Carcinogen Risk Assessment (EPA, 1996), there are inadequate data to determine the potential carcinogenicity of trivalent chromium, as discussed below. However, the classification of hexavalent chromium as a known human carcinogen raises a concern for the carcinogenic potential of trivalent chromium.

EPA has established an MCL of 0.1 mg/L for chromium (total).

### **Di-n-octyl phthalate**

Di-n-octyl phthalate is an aromatic dicarboxylic acid ester. It is a liquid with a very high boiling point and a very low vapor pressure that is sometimes mistakenly reported as its isomer, bis(2-ethylhexyl)

phthalate, in the literature. No information on the environmental fate or the health effects could be located in the literature. (Clement Associates)

### **Ethylbenzene**

Ethyl benzene has a strong tendency to partition into the atmosphere, as indicated by its physical and chemical properties and the magnitude of the Henry's Law constant. Migration occurs in most soils, although sorption and retardation by soil organic carbon may occur to a small extent. Ethyl benzene is transported in the atmosphere until it is removed by physical or chemical processes.

Exposure of humans to ethyl benzene at concentrations of 230 ppm and above causes eye and throat irritations and vertigo. A variety of acute and subchronic inhalation exposures in rats, mice, and rabbits indicate that ethyl benzene causes toxicity to lungs, liver, kidney, and hematological and reproductive systems. No data are available on the effects of dermal exposure of humans to ethyl benzene. A single study of dermal exposure to ethyl benzene in rabbits found irritation and blistering to the skin and eye.

No data are available on the carcinogenicity of ethyl benzene to humans; therefore, it is classified in Class D, not classifiable as to human carcinogenicity. The National Toxicology Program has plans to evaluate the rodent carcinogenicity of ethyl benzene (IRIS 1998).

EPA has established an MCL of 0.7 mg/L for this chemical.

### **4-Methyl-2-Pentanone**

4-methyl-2-pentanone is a synonym for methyl isobutyl ketone or MIBK. It produced kidney damage in exposed rats. In humans, exposure has produced headaches, nausea, vomiting and eye irritations. MIBK in general is not very persistent in the environment. It is expected to volatilize fairly readily. However, because it is somewhat soluble in water, volatilization from wet environments is probably limited. Once in the atmosphere, it is apparently oxidized. MIBK has a low octanol/water partition coefficient and therefore is probably not readily absorbed. Biodegradation is probably the predominant fate of MIBK in the environment. No studies of carcinogenicity were found in the literature. Kidney damage was observed in rats exposed to 400 mg/m<sup>3</sup> of MIBK for 2 weeks but the damage appeared to be reversible. MIBK caused headache, nausea, vomiting, and eye irritation in a number of workers exposed to concentrations of 200 to 2,000 mg/m<sup>3</sup>. MIBK is probably also not very toxic to aquatic species or to terrestrial animals. (Clement Associates)

### **Pentachlorophenol**

Pentachlorophenol is probably persistent in the natural environments. It is embryotoxic and fetotoxic. Chronic exposure has been shown to cause chloracne, headache, muscle weakness, weight loss, and

liver and kidney damage. Pentachlorophenol is highly toxic to aquatic organisms. (Clement Associates)

The critical effect of pentachlorophenol is liver and kidney pathology according to a rat oral chronic study by Schwetz et al (1978).

Only one chronic study regarding oral exposure was located in the available literature. Twenty-five rats/sex were administered 1 of 3 doses in the diet. At the 30 mg/kg/day level of treatment, a reduced rate of body weight gain and increased specific gravity of the urine were observed in females. Pigmentation of the liver and kidneys was observed in females exposed at 10 mg/kg/day or higher levels and in males exposed to 30 mg/kg/day. The 3 mg/kg/day level of exposure was reported as a chronic NOAEL. A number of studies that have investigated the teratogenicity of orally administered pentachlorophenol in rodents are available in the literature. Although these studies did not reveal teratogenic effects, fetomaternal toxicity was seen at 30 mg/kg/day. Since pentachlorophenol apparently does not cross the placental barrier, the observed fetotoxicity may be a reflection of maternal toxicity.

The classification, B2—probable human carcinogen, is based on inadequate human data and sufficient evidence of carcinogenicity in animals: statistically significant increases in the incidences of multiple biologically significant tumor types (hepatocellular adenomas and carcinomas, adrenal medulla pheochromocytomas and malignant pheochromocytomas, and/or hemangiosarcomas and hemangiomas) in one or both sexes of B6C3F1 mice using two different preparations of pentachlorophenol (PeCP). In addition, a high incidence of two uncommon tumors (adrenal medulla pheochromocytomas and hemangiomas/hemangiosarcomas) was observed with both preparations. This classification is supported by mutagenicity data, which provides some indication that PeCP has clastogenic potential.

### **Polychlorinated Biphenyls (PCBs)**

This is a general assessment of PCBs, which include a wide variety of substances. Chemical-specific information is contained within individual listings. PCBs are classified B2, probable human carcinogens. A 1996 study found liver tumors in female rats exposed to Aroclors 1260, 1254, 1242, and 1016, and in male rats exposed to Aroclor 1260. These mixtures contain overlapping groups of congeners that, together, span the range of congeners most often found in environmental mixtures. Earlier studies found high, significantly significant incidences of liver tumors in rats ingesting Aroclor 1260 or Clophen A 60. Mechanistic studies are beginning to identify several congeners that have dioxin-like activity and may promote tumors by different modes of action. PCBs are absorbed through ingestion, inhalation, and dermal exposure, after which they are transported similarly through the circulation. This provides a reasonable basis for expecting similar internal effects from different routes of environmental exposure. Information on relative absorption rates suggests that differences

in toxicity across exposure routes is small. The human studies are being updated; currently available evidence is inadequate, but suggestive. (IRIS)

### **Tetrachloroethene**

Tetrachlorethene is a synonym of tetrachloroethylene. Tetrachloroethylene (CAS No. 127-18-4) is a halogenated aliphatic hydrocarbon with a vapor pressure of 17.8 mm Hg at 25C (U.S. EPA, 1982). The chemical is used primarily as a solvent in industry and, less frequently, in commercial dry-cleaning operations (ATSDR, 1990). Occupational exposure to tetrachloroethylene occurs via inhalation, resulting in systemic effects, and via dermal contact, resulting in local effects. Exposure to the general population can occur through contaminated air, food and water (ATSDR, 1990).

The respiratory tract is the primary route of entry for tetrachloroethylene (NTP, 1986; U.S. EPA, 1988). The chemical is rapidly absorbed by this route and reaches an equilibrium in the blood within 3 hours after the initiation of exposure (Hake and Stewart, 1977). Tetrachloroethylene is also significantly absorbed by the gastrointestinal (g.i.) tract, but not through the skin (Koppel et al., 1985; ATSDR, 1990). The chemical accumulates in tissues with high lipid content, where the half-life is estimated to be 55 hours (Stewart, 1969; ATSDR, 1990), and has been identified in perineal fat, brain, liver, placental tissue, and amniotic fluid (Savolainen et al., 1977). The proposed first step for the biotransformation of tetrachloroethylene is the formation of an epoxide thought to be responsible for the carcinogenic potential of the chemical (Henschler and Hoos, 1982; Calabrese and Kenyon, 1991). Tetrachloroethylene is excreted mainly unchanged through the lungs, regardless of route of administration (NTP, 1986). The urine and feces comprise secondary routes of excretion (Monster et al., 1979; Ohtsuki et al., 1983). The major urinary metabolite of tetrachloroethylene, trichloroacetic acid, is formed via the cytochrome P-450 system (ATSDR, 1990).

The main targets of tetrachloroethylene toxicity are the liver and kidney by both oral and inhalation exposure, and the central nervous system by inhalation exposure. Acute exposure to high concentrations of the chemical (estimated to be greater than 1500 ppm for a 30-minute exposure) may be fatal to humans (Torkelson and Rowe, 1981). Chronic exposure causes respiratory tract irritation, headache, nausea, sleeplessness, abdominal pains, constipation, cirrhosis of the liver, hepatitis, and nephritis in humans; and microscopic changes in renal tubular cells, squamous metaplasia of the nasal epithelium, necrosis of the liver, and congestion of the lungs in animals (Chmielewski et al., 1976; Coler and Rossmiller, 1953; Stewart et al., 1970; von Ottingen, 1964; Stewart, 1969; NTP, 1986).

Some epidemiology studies have found an association between inhalation exposure to tetrachloroethylene and an increased risk for spontaneous abortion, idiopathic infertility, and sperm abnormalities among dry-cleaning workers, but others have not found similar effects (Kyyronen et al., 1989; van der Gulden and Zielhuis, 1989). The adverse effects in humans are supported in part by the

results of animal studies in which tetrachloroethylene induced fetotoxicity (but did not cause malformations) in the offspring of treated dams (Schwetz et al., 1975; Beliles et al., 1980; Nelson et al., 1980).

Reference doses (RfDs) for subchronic and chronic oral exposure to tetrachloroethylene are 1E-1 mg/kg/day and 1E-2 mg/kg/day, respectively (Buben and Flaherty, 1985; U.S. EPA, 1990; 1992a). These values are based on hepatotoxicity observed in mice given 100 mg tetrachloroethylene/kg body weight for 6 weeks and a no-observed-adverse effect level (NOAEL) of 20 mg/kg.

Epidemiology studies of dry cleaning and laundry workers have demonstrated excesses in mortality due to various types of cancer, including liver cancer, but the data are regarded as inconclusive because of various confounding factors (Lynge and Thygesen, 1990; U.S. EPA, 1988). The tenuous finding of an excess of liver tumors in humans is strengthened by the results of carcinogenicity bioassays in which tetrachloroethylene, administered either orally or by inhalation, induced hepatocellular tumors in mice (NCI, 1977; NTP, 1986). The chemical also induced mononuclear cell leukemia and renal tubular cell tumors in rats. Tetrachloroethylene was negative for tumor initiation in a dermal study and for tumor induction in a pulmonary tumor assay (Van Duuren et al., 1979; Theiss et al., 1977).

Although U.S. EPA's Science Advisory Board recommended a weight-of-evidence classification of C-B2 continuum (C = possible human carcinogen; B2 = probable human carcinogen), the agency has not adopted a current position on the weight-of-evidence classification (U.S. EPA, 1992b). In an earlier evaluation, tetrachloroethylene was assigned to weight-of-evidence Group B2, probable human carcinogen, based on sufficient evidence from oral and inhalation studies for carcinogenicity in animals and no or inadequate evidence for carcinogenicity to humans (NCI, 1977; NTP, 1986; U.S. EPA, 1987). The unit risk and slope factor values for tetrachloroethylene have been withdrawn from IRIS and HEAST. The upper bound risk estimates from the 1985 Health Assessment Document (U.S. EPA, 1985) as amended by inhalation values from the 1987 addendum (U.S. EPA, 1987) have not yet been verified by the IRIS-CRAVE Workgroup. For oral exposure, the slope factor is  $5.2\text{E-}2$  (mg/kg/day) $^{-1}$ ; the unit risk is  $1.5\text{E-}6$  ( $\mu\text{g/L}$ ) $^{-1}$ . For inhalation exposure, the slope factor is  $2.0\text{E-}3$  (mg/kg/day) $^{-1}$ ; the unit risk ranges from  $2.9\text{E-}7$  to  $9.5\text{E-}7$  ( $\mu\text{g/m}^3$ ) $^{-1}$  with a geometric mean of  $5.8\text{E-}7$  ( $\mu\text{g/m}^3$ ) $^{-1}$  (U.S. EPA, 1987). When the Agency makes a decision about weight-of-evidence, the CRAVE-IRIS verification will be completed and the information put on IRIS (U.S. EPA, 1992b).

## **Toluene**

The principal effect associated with exposure to toluene is depression of the central nervous system. In humans, inhalation of toluene in air at concentrations of 100 ppm can cause sleepiness and decreased dexterity. Exposure to levels of 200 to 800 ppm can lead to narcosis, characterized by



impaired mental and motor functions. These effects appear to be fully reversible, although very high exposures can lead to permanent central nervous system damage and may produce such profound CNS depression that death ensues.

Volatilization appears to be the major route of removal of toluene from aquatic environments, and atmospheric reactions of toluene probably subordinate all other fate processes. Photooxidation is the primary atmospheric fate process for toluene, and benzaldehyde is reported to be the principal organic product. Subsequent precipitation or dry deposition can deposit toluene and its oxidation products into aquatic and terrestrial systems. (Clement Associates)

The principal study was conducted by the National Toxicology Program (1989). The oral toxicity of toluene was investigated in this subchronic gavage study in F344 rats. Several toxic effects were noted at doses greater than or equal to 2500 mg/kg, included prostration, hypoactivity, ataxia, piloerection, lacrimation, excessive salivation, and body tremors. No signs of biologic significance were seen in groups receiving less than or equal to 1250 mg/kg. There were several pathologic findings and organ weight changes in the liver, kidney, brain, and urinary bladder. (IRIS)

Inhalation exposure to toluene does not usually lead to significant effects on tissues other than the central nervous system (Bruckner 1981), although lung irritation, decreased immunological function, and development effects have been noted in some studies of animals or humans exposed to levels of 200 ppm or higher (Courney, 1942). (HEAST 1991)

In a 2-year bioassay, Fischer 344 rats (60/sex/group) were exposed to 0, 600, or 1200 ppm toluene vapors, 6.5 hours/day, 5 days/week.. At the end of 2 years, there was a significant increase in the incidence of erosion of the olfactory epithelium in the exposed animals. (National Toxicology Program, 1990).(IRIS)

Toluene-induced neurotoxicity has been documented in humans over a broad spectrum of severity that correlates well with concentration. Numerous case studies on chronic toluene abuses (repeatedly exposed to greater than 30,000 ppm) have demonstrated functional deficits of the CNS accompanied by abnormal morphology of cerebellar and cortical areas of the brain. Under acute exposure conditions (short exposures to greater than 10,000 ppm), toluene produces CNS narcosis (ACGIH). Lower concentrations (i.e., 800-400 ppm) have been associated with worker complaints of CNS-related effects. Clinical studies using controlled exposure to toluene have demonstrated concentration-related occurrence of complaints such as drowsiness, ataxia, visual impairment, and headache. (IRIS)

Dermal or ocular contact with toluene can result in irritation and skin damage, but neurological or systemic effects have not been noted (ATSDR 1988)

There are no studies of humans that indicate that toluene is carcinogenic, and cancer studies of animals exposed by inhalation (CIIT 1980) or dermal contact (Weiss 1986) have been negative. However, due to limitations in these studies, the EPA does not consider the weight of evidence adequate to rank toluene as a noncarcinogen. (App A). Toluene did not produce positive results in the majority of genotoxic assays. (IRIS) Toluene has been shown to be embryotoxic in experimental animals, and the incidence of cleft palate increased in the offspring of dosed mice. (Clement Associates)

### **1,1,1-Trichloroethane**

1,1,1-Trichloroethane (1,1,1-TCA) was shown to be mutagenic using the Ames assay, and it causes transformation in cultured rat embryo cells. Inhalation exposure to high concentration of 1,1,1-TCA depressed the central nervous system; affected cardiovascular function; and damaged the lungs, liver, and kidneys in animals and humans. Irritation of the skin and mucous membranes has also been associated with human exposure. 1,1,1-TCA disperses from surface water primarily by volatilization. Several studies have indicated that it may be adsorbed onto organic materials in the sediment, but this is probably not an important route of elimination from surface water. 1,1,1-TCA can be transported in the groundwater, but the speed of transport depends on the composition of the soil. Photooxidation by reaction with hydroxyl radicals in the atmosphere is probably the principal fate process. The most notable toxic effects of 1,1,1-TCA in humans and animals are central nervous system depression, including anesthesia at very high concentrations and impairment of coordination, equilibrium, and judgment at lower concentrations (350 ppm and above), cardiovascular effects, including premature ventricular contractions, decreased blood pressure, and sensitization to epinephrine-induced arrhythmia; and adverse effects on the lungs, liver, and kidneys. Irritation of the skin and mucous membranes resulting from exposure have also been reported. (Clement Associates)

There are no reported human data and animal studies (one lifetime gavage, one intermediate-term inhalation) that have demonstrated carcinogenicity. Technical grade 1,1,2-trichloroethane gas has been shown to be weakly mutagenic, although the contaminant, 1,4-dioxane, a known animal carcinogen, may be responsible for this response. (IRIS)

### **Trichloroethene**

Trichloroethene (TCE) is an industrial solvent used primarily in metal degreasing and cleaning operations. TCE can be absorbed through the lungs, mucous membranes, gastrointestinal tract, and the skin. TCE is extensively metabolized in humans to trichloroacetic acid and trichloroethanol, as well as to several minor metabolites, with most of the absorbed dose excreted in urine (ATSDR, 1989; U.S. EPA, 1985).

TCE rapidly volatilizes into the atmosphere where it reacts with hydroxyl radicals to produce hydrochloric acid, carbon monoxide, carbon dioxide, and carboxylic acid. This is probably the most

important transport and fate process for TCE in surface water and in the upper layer of soil. TCE adsorbs to organic materials and can be bioaccumulated to some degree. TCE leaches into the groundwater fairly readily. (Clement Associates)

Human and animal data indicate that exposure to TCE can result in toxic effects on a number of organs and systems, including the liver, kidney, blood, skin, immune system, reproductive system, nervous system, and cardiovascular system. In humans, acute inhalation exposure to TCE causes central nervous system symptoms such as headache, dizziness, nausea, and unconsciousness (U.S. EPA, 1985). Among the reported effects from occupational exposure studies are fatigue, light-headedness, sleepiness, vision distortion, abnormal reflexes, tremors, ataxia, nystagmus, increased respiration, as well as neurobehavioral or psychological changes. Cardiovascular effects include tachycardia, extrasystoles, EKG abnormalities, and precordial pain (Landrigan et al., 1987; Grandjean et al., 1955; Milby, 1968). The use of TCE as an anesthetic has been associated with cardiac arrhythmias (U.S. EPA, 1985).

Cases of severe liver and kidney damage, including necrosis, have been reported in humans following acute exposure to TCE (Defalque, 1961), but these effects generally are not associated with long-term occupational exposures. In animals, TCE has produced liver enlargement with hepatic biochemical and/or histological changes (Nomiyama et al., 1986; Kjellstrand et al., 1981, 1983; Stott et al., 1982; Tucker et al., 1982) and kidney enlargement, renal tubular alterations and/or toxic nephropathy (NTP, 1982, 1986a, 1988). Also observed in animals were hematological effects (Tucker et al., 1982; Mazza and Brancaccio, 1967) and immunosuppression (Sanders et al., 1982). Inhalation studies with rats indicate that TCE is a developmental toxicant causing skeletal ossification anomalies and other effects consistent with delayed maturation (Healy et al., 1982; Dorfmueller et al., 1979). TCE may cause dermatitis and dermographism (U.S. EPA, 1985).

Epidemiologic studies have been inadequate to determine if a correlation exists between exposure to TCE and increased cancer risk. Chronic oral exposure to TCE increased the incidences of hepatocellular carcinomas in mice and renal adenocarcinomas and leukemia in rats (NTP, 1988; Maltoni et al., 1986; NTP, 1986a, 1982; NCI, 1976). Chronic inhalation exposure induced lung and liver tumors in mice and testicular Leydig cell tumors in rats (Maltoni et al., 1986, 1988; Fukuda et al., 1983; Bell et al., 1978). Although U.S. EPA's Science Advisory Board recommended a weight-of-evidence classification of C-B2 continuum (C = possible human carcinogen; B2 = probable human carcinogen), the agency has not adopted a current position on the weight-of-evidence classification (U.S. EPA, 1992b). In an earlier evaluation, TCE was assigned to weight-of-evidence Group B2, probable human carcinogen, based on tumorigenic responses in rats and mice for both oral and inhalation exposure and on inadequate data in humans (U.S. EPA, 1987, 1990). Carcinogen slope

factors are  $1.1\text{E-}2$  (mg/kg/day)<sup>-1</sup> and  $6.0\text{E-}3$  (mg/kg/day)<sup>-1</sup> for oral and inhalation exposure, respectively. (U.S. EPA, 1992b).

## **Xylenes**

Most xylenes released to water or soil tend to evaporate into the air because of their moderate volatility. Volatilization half-lives range from several hours to several weeks, depending upon conditions. Xylenes degrade in air mainly by reacting with photochemically generated hydroxyl radicals, with usual half-lives of eight to twenty-four hours. Significant levels may exist in surface water or groundwater because of their moderate water solubility. Xylenes have only a moderate tendency to adsorb onto soil or sediment because of a fairly low octanol water partition coefficient. In water, soil and sediment, biodegradation occurs with usual half-lives of about ten days, but volatilization remains the primary fate in the environment. (ATSDR)

Acute inhalation exposure of humans to xylenes at levels of 200 ppm or higher irritates the eyes, nose, and throat (ACGIH 1986; ATSDR 1989). Similar levels (100 to 400 ppm) can lead to central nervous system effects, including headache, nausea, and decreased performance on tests on mental and physical dexterity (EPA 1989; ATSDR 1989).

Acute oral doses of 2,000 mg/kg/day or more leads to shallow breathing, unsteadiness, tremors, and prostration in mice. These effects tend to appear within five to 10 minutes and last 15 to 60 minutes. Acute oral doses of 4,000 to 6,000 mg/kg/day can cause death (EPA 1989).

Effects of longer-term exposure of humans to xylene are not well documented, but studies of animals suggest the liver is subject to mild injury. Inhalation exposure of rats to concentrations of 3,500 ppm for six weeks caused liver enlargement (but no histologic abnormalities), but no effects were noted at 810 ppm. USEPA has calculated a chronic inhalation RfD of 0.3 mg/kg/day (HEAST 1991).

Oral exposure of rats to 10 mg/kg/day for six months resulted only in increased vacuolation in hepatocytes (Bowers 1982). Chronic (2-year) oral dosing of rats with 500 mg/kg/day caused hyperactivity (a sign of CNS toxicity) in mice. No clinical signs of injury were detected in rats or mice at doses of 250 mg/kg/day. Based on this value, the EPA has calculated a chronic oral RfD for xylene of 2 mg/kg/day (IRIS 1987).

Another effect of concern is fetotoxicity. Epidemiological studies of women exposed to xylenes are not adequate to draw firm conclusions, but fetotoxicity has been reported in animals exposed to concentrations of 12 to 691 ppm in air during gestation (ATSDR 1989). This has not been reported following oral exposure of animals.

Some earlier studies of xylene effects in animals have reported effects on the blood, but this is suspected to be because of traces of benzene concentration. No hematological abnormalities were detected in the recent subchronic or chronic oral studies.

Xylene has been found to have some developmental effects in animals exposed to relatively high doses, but the RfD values calculated are believed to be protective for these effects (IRIS 1987).

Xylenes have been tested for genotoxic potential in a variety of systems, and the results indicate that xylene is nonmutagenic (IRIS 1990). Limited data suggest that oral exposure of rats to 500 mg/kg/day for one year might cause increased frequency of tumors. In a more thorough study, the NTP (1986) detected no evidence of tendency to develop tumors in rats exposed to 500 mg/kg/day or in mice exposed to 1,000 mg/kg/day for two years.

TABLE 3-1  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 1) - Griffith, Indiana

File: table3\_1.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface soil	Surface Soil	Routine Worker & Utility Worker	Adult	Dermal	On-Site	Quant	Although large portions of Area 1 are covered by buildings and have a maintained cover of aggregate material, worker exposures to surface soil may occur in areas without aggregate cover.
						Ingestion	On-site	Quant	Although large portions of Area 1 are covered by buildings and have a maintained cover of aggregate material, worker exposures to surface soil may occur in areas without aggregate cover.
				Construction Worker	Adult	Dermal	On-site	None	No construction during the current land use without reassessment.
						Ingestion	On-site	None	No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassing is controlled by ACS under current land use.
						Ingestion	On-site	None	Trespassing is controlled by ACS under current land use.
		Air	Vapors / Particulates	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	Quant	Although large portions of Area 1 are covered by buildings and have a maintained cover of aggregate material, worker exposures to soil may occur in areas without aggregate cover.
				Construction Worker	Adult	Inhalation	On-site	None	No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassing is controlled by ACS under current land use.
	Subsurface soil	Subsurface soil	Subsurface soil	Routine Worker	Adult	Dermal	On-Site	None	Routine workers are not expected to engage in intrusive activities greater than 2 feet below the ground surface.
						Ingestion	On-site	None	Routine workers are not expected to engage in intrusive activities greater than 2 feet below the ground surface.
				Utility Worker	Adult	Dermal	On-Site	Quant	Although large portions of Area 1 are covered by buildings and have a maintained cover of aggregate material, worker exposures to soil may occur in areas without aggregate cover.
						Ingestion	On-site	Quant	Although large portions of Area 1 are covered by buildings and have a maintained cover of aggregate material, worker exposures to soil may occur in areas without aggregate cover.
				Construction Worker	Adult	Dermal	On-site	None	No construction during the current land use without reassessment.
						Ingestion	On-site	None	No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassing is controlled by ACS under current land use.
						Ingestion	On-site	None	Trespassing is controlled by ACS under current land use.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Routine workers are not expected to engage in intrusive activities.
				Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers are assumed to work without personal protective equipment.
				Construction Worker	Adult	Inhalation	On-site	None	No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassing is controlled by ACS under current land use.

TABLE 3-1  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 1) - Griffith, Indiana

File: table3\_1.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Routine Worker & Utility Worker	Adult	Dermal	On-Site	Quant	Workers are likely come into contact with surface water onsite.
						Ingestion	On-site	Quant	Workers are likely come into contact with surface water onsite.
				Construction Worker	Adult	Dermal	On-site	None	Construction workers are not expected to come into contact with onsite surface water.
						Ingestion	On-site	None	Construction workers are not expected to come into contact with onsite surface water.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassing is controlled by ACS under current land use.
						Ingestion	On-site	None	Trespassing is controlled by ACS under current land use.
	Air	Air	Vapor emissions from Area 2	Routine / Utility Worker	Adult	Inhalation	On-Site	Qual	Routine workers are likely come into contact with vapor emissions from Area 2 soil.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 2 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassing is controlled by ACS under current land use.
			Vapor emissions from Area 3	Routine / Utility Worker	Adult	Inhalation	On-Site	Qual	Routine workers are likely come into contact with vapor emissions from Area 3 soil.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassing is controlled by ACS under current land use.
	Other	Soil	Buried Drums	Routine Worker / Utility Worker	Adult	Dermal	On-Site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled hazardous waste release. However, this pathway is not easily quantifiable.
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled hazardous waste release. However, this pathway is not easily quantifiable.
				Construction Worker	Adult	Dermal	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled hazardous waste release. However, this pathway is not easily quantifiable.
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled hazardous waste release. However, this pathway is not easily quantifiable.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassing is controlled by ACS under current land use.
						Ingestion	On-site	None	Trespassing is controlled by ACS under current land use.
		Air	Vapors from buried drums	Routine / Utility Worker	Adult	Inhalation	On-Site	Qual	Routine workers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassing is controlled by ACS under current land use.

TABLE 3-1  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 1) - Griffith, Indiana

File: table3\_1.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Water from upper aquifer	Routine Worker	Adult	Dermal Ingestion	On-Site On-Site	None None	Routine workers are not expected to engage in activities that would place them in contact with upper aquifer groundwater. Routine workers are not expected to engage in activities that would place them in contact with upper aquifer groundwater.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-Site	Quant None	Utility workers are expected to engage in activities that would place them in direct contact with upper aquifer groundwater. Utility workers are not expected to ingest water from the upper aquifer.
				Construction Worker	Adult	Dermal Ingestion	On-Site On-Site	None None	No construction during the current land use without reassessment. No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-Site On-Site	None None	Trespassing is controlled by ACS under current land use. Trespassing is controlled by ACS under current land use.
			Vapors from upper aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Routine workers are not expected to engage in activities that would place them in contact with upper aquifer groundwater.
				Utility Worker	Adult	Inhalation	On-Site	Quant	Utility workers are assumed to work without personal protective equipment and may inhale vapors from upper aquifer water.
				Construction Worker	Adult	Inhalation	On-Site	None	No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Inhalation	On-Site	None	Trespassing is controlled by ACS under current land use.
		Groundwater	Water from lower aquifer	Routine Worker & Utility Worker	Adult	Dermal Ingestion	On-Site On-Site	Quant Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer. Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Dermal Ingestion	On-Site On-Site	None None	No construction during the current land use without reassessment. No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-Site On-Site	None None	Trespassing is controlled by ACS under current land use. Trespassing is controlled by ACS under current land use.
			Vapors from lower aquifer	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Inhalation	On-Site	None	No construction during the current land use without reassessment.
				Trespasser/Visitor	Adolescents	Inhalation	On-Site	None	Trespassing is controlled by ACS under current land use.



TABLE 3-1  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 1) - Griffith, Indiana

File: table3\_1.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface & subsurface soil	Surface & subsurface soil	Surface & subsurface soil	Routine Worker & Utility Worker	Adult	Dermal Ingestion	On-Site On-site	Quant Quant	Future workers may be exposed to surface and subsurface soil in the future if cover is not maintained. Future workers may be exposed to surface and subsurface soil in the future if cover is not maintained.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	Quant Quant	Due to shallow depth to groundwater, construction workers are assumed to work only to a depth of 4 feet below surface. Due to shallow depth to groundwater, construction workers are assumed to work only to a depth of 4 feet below surface.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	Quant Quant	Trespasser exposures to surface soil may occur in areas without aggregate cover. Trespasser exposures to surface soil may occur in areas without aggregate cover.
		Air	Vapors / Particulates	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	Quant	Future workers may be exposed to surface soil in the future if cover is not maintained.
				Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers are assumed to work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespasser exposures to surface soil may occur in areas without aggregate cover.
	Sediments	Sediments	Sediments	Routine Worker & Utility Worker	Adult	Dermal Ingestion	On-site On-site	Quant Quant	Future Worker exposures to sediment are possible in Area I. Future Worker exposures to sediment are possible in Area I.
				Trespasser/Visitor	Adolescent Adolescent	Dermal Ingestion	On-site On-site	Quant Quant	Future Trespasser/Visitor exposures to sediment are possible in Area I. Future Trespasser/Visitor exposures to sediment are possible in Area I.
				Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Routine workers are not expected to engage in activities that would place them in contact with upper aquifer groundwater. Routine workers are not expected to engage in activities that would place them in contact with upper aquifer groundwater.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-Site	Quant None	Utility workers are expected to engage in activities that would place them in contact with upper aquifer groundwater. Utility workers are not expected to ingest water from the upper aquifer.
	Groundwater	Groundwater	Water from upper aquifer	Construction Worker	Adult	Dermal Ingestion	On-site On-site	Quant None	Construction workers are assumed to work without personal protective equipment and may contact upper aquifer water. Construction workers are not expected to ingest water from the upper aquifer.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to engage in intrusive activities that would place them in contact with upper aquifer groundwater.

TABLE 3-1  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 1) - Griffith, Indiana

File: table3\_1 WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	Water from Upper Aquifer	Trespasser/Visitor	Adolescents	Ingestion	On-site	None	Trespassers are not expected to engage in intrusive activities that would place them in contact with upper aquifer groundwater.
		Air	Vapors from upper aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Routine workers are not expected to engage in activities that would place them in contact with upper aquifer groundwater.
				Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers are assumed to work without personal protective equipment and may inhale vapors from upper aquifer water.
				Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers are assumed to work without personal protective equipment and may inhale vapors from upper aquifer water.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to engage in intrusive activities that would place them in contact with upper aquifer groundwater.
		Groundwater	Water from lower aquifer	Routine Worker & Utility Worker	Adult	Dermal	On-Site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
						Ingestion	On-site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Dermal	On-site	None	Construction workers are not expected to come into contact with water from onsite wells in the lower aquifer.
						Ingestion	On-site	None	Construction workers are not expected to come into contact with water from onsite wells in the lower aquifer.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to be in contact with lower aquifer groundwater.
						Ingestion	On-site	None	Trespassers are not expected to be in contact with lower aquifer groundwater.
		Air	Vapors from lower aquifer	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Inhalation	On-site	None	Construction workers are not expected to come into contact with water from onsite wells in the lower aquifer.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to be in contact with lower aquifer groundwater.
	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Routine Worker	Adult	Dermal	On-Site	Quant	Routine workers are likely come into contact with surface water onsite.
						Ingestion	On-site	Quant	Routine workers are likely come into contact with surface water onsite.
				Utility Worker	Adult	Dermal	On-Site	None	Utility workers are not likely come into contact with surface water onsite.
						Ingestion	On-site	None	Utility workers are not likely come into contact with surface water onsite.
				Construction Worker	Adult	Dermal	On-site	Quant	Construction workers are likely come into contact with surface water onsite.
						Ingestion	On-site	Quant	Construction workers are likely come into contact with surface water onsite.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers are likely come into contact with surface water onsite.
						Ingestion	On-site	Quant	Trespassers are likely come into contact with surface water onsite.

TABLE 3-1  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 1) - Griffith, Indiana

File: table3\_1.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Air	Air	Vapor emissions from Area 2	Routine / Utility Workers	Adult	Inhalation	On-Site	Qual	Workers are likely come into contact with vapor emissions from Area 2 soil, but this pathway is not significant.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 2 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers are likely come into contact with vapor emissions from Area 2 soil, but this pathway is not significant.
		Air	Vapor emissions from Area 3	Routine / Utility Workers	Adult	Inhalation	On-Site	Qual	Workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
	Other	Soil	Buried Drums	Routine Worker / Utility Worker	Adult	Dermal	On-Site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable
				Construction Worker	Adult	Dermal	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable
				Trespasser/Visitor	Adolescents	Dermal	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable
		Air	Vapors from buried drums	Routine Worker	Adult	Inhalation	On-Site	Qual	Routine workers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface soil	Surface Soil	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-site	Quant Quant	Utility workers may be exposed to soil from 0-10' bgs. Utility workers may be exposed to soil from 0-10' bgs.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	Quant Quant	Trespassers may gain access to this area of the site and come into contact with surface soil. Trespassers may gain access to this area of the site and come into contact with surface soil.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers are assumed to be in contact with vapors/particulates in surface and subsurface soils.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with surface soil.
	Subsurface soil	Subsurface soil	Subsurface soil	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-Site	Quant Quant	Utility workers may be exposed to soil from 0-10' bgs. Utility workers may be exposed to soil from 0-10' bgs.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Although trespassers may gain access to the site, it is unlikely that they will come into contact with subsurface soil.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers may be exposed to soil from 0-10' bgs.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Although trespassers may gain access to the site, it is unlikely that they will come into contact with subsurface soil.
	Sediments	Sediments	Sediments	Trespasser/Visitor	Adolescents	Dermal	On-Site	Quant	Trespassers may gain access to this area and come into contact with sediment
						Ingestion	On-site	Quant	Trespassers may gain access to this area and come into contact with sediment

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Water from upper aquifer	Routine Worker & Utility Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water. Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Due to the depth to the upper groundwater aquifer (10-16 feet), trespassers are not expected to have contact with water. Due to the depth to the upper groundwater aquifer (10-16 feet), trespassers are not expected to have contact with water.
		Air	Vapors from upper aquifer	Routine / Utility Worker	Adult	Inhalation	On-Site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Trespassers are not expected to come into contact with lower aquifer water. Trespassers are not expected to come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with lower aquifer water.
	Air	Air	Vapor emissions from Area 3	Routine / Utility Worker	Adult	Inhalation	On-Site	Qual	Workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers may come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface and subsurface soil	Surface and subsurface soil	Surface and subsurface soil	Routine Worker	Adult	Dermal	On-Site	Quant	Future workers may be exposed to surface and subsurface soil to a depth of 10 feet. It was assumed soil to a two foot depth may be brought to the surface during utility maintenance and construction work and intermixed with the existing surface soil.
						Ingestion	On-site	Quant	Future workers may be exposed to surface and subsurface soil to a depth of 10 feet. It was assumed soil to a two foot depth may be brought to the surface during utility maintenance and construction work and intermixed with the existing surface soil.
				Utility Worker	Adult	Dermal	On-site	Quant	Workers are assumed to be in contact with subsurface soils to a depth of 10 feet.
						Ingestion	On-site	Quant	Workers are assumed to be in contact with subsurface soils to a depth of 10 feet.
				Construction Worker (Slab on Grade)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0 - 4 feet bgs and work without personal protective equipment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0 - 4 feet bgs and work without personal protective equipment.
				Construction worker (other)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0-10 feet bgs and work without personal protective equipment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0-10 feet bgs and work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
						Ingestion	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
	Air	Vapors / Particulates		Routine Worker	Adult	Inhalation	On-Site	Quant	Routine workers are assumed to be in contact with vapors/particulates subsurface soils brought to the surface.
				Utility Worker	Adult	Inhalation	On-Site	Quant	Utility workers are assumed to be in contact with vapors/particulates subsurface soils brought to the surface.
				Construction Worker (Slab on grade)	Adult	Inhalation	On-site	Quant	Construction workers are assumed to be in contact with vapors/particulates from subsurface soils brought to the surface and work without personal protective equipment.
				Construction worker (other)	Adult	Inhalation	On-site	Quant	Construction workers are assumed to be in contact with vapors/particulates from subsurface soils brought to the surface and work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface soil	Surface Soil	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-site	Quant Quant	Utility workers may be exposed to soil from 0-10' bgs. Utility workers may be exposed to soil from 0-10' bgs.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	Quant Quant	Trespassers may gain access to this area of the site and come into contact with surface soil. Trespassers may gain access to this area of the site and come into contact with surface soil.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers are assumed to be in contact with vapors/particulates in surface and subsurface soils.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with surface soil.
	Subsurface soil	Subsurface soil	Subsurface soil	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-Site	Quant Quant	Utility workers may be exposed to soil from 0-10' bgs. Utility workers may be exposed to soil from 0-10' bgs.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Although trespassers may gain access to the site, it is unlikely that they will come into contact with subsurface soil.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers may be exposed to soil from 0-10' bgs.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Although trespassers may gain access to the site, it is unlikely that they will come into contact with subsurface soil.
	Sediments	Sediments	Sediments	Trespasser/Visitor	Adolescents	Dermal	On-Site	Quant	Trespassers may gain access to this area and come into contact with sediment
						Ingestion	On-site	Quant	Trespassers may gain access to this area and come into contact with sediment

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Water from upper aquifer	Routine Worker & Utility Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water. Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Due to the depth to the upper groundwater aquifer (10-16 feet), trespassers are not expected to have contact with water. Due to the depth to the upper groundwater aquifer (10-16 feet), trespassers are not expected to have contact with water.
		Air	Vapors from upper aquifer	Routine / Utility Worker	Adult	Inhalation	On-Site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Trespassers are not expected to come into contact with lower aquifer water. Trespassers are not expected to come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with lower aquifer water.
	Air	Air	Vapor emissions from Area 3	Routine / Utility Worker	Adult	Inhalation	On-Site	Qual	Workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers may come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.



TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface and subsurface soil	Surface and subsurface soil	Surface and subsurface soil	Routine Worker	Adult	Dermal	On-Site	Quant	Future workers may be exposed to surface and subsurface soil to a depth of 10 feet. It was assumed soil to a two foot depth may be brought to the surface during utility maintenance and construction work and intermixed with the existing surface soil.
						Ingestion	On-site	Quant	Future workers may be exposed to surface and subsurface soil to a depth of 10 feet. It was assumed soil to a two foot depth may be brought to the surface during utility maintenance and construction work and intermixed with the existing surface soil.
				Utility Worker	Adult	Dermal	On-site	Quant	Workers are assumed to be in contact with subsurface soils to a depth of 10 feet.
						Ingestion	On-site	Quant	Workers are assumed to be in contact with subsurface soils to a depth of 10 feet.
				Construction Worker (Slab on Grade)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0 - 4 feet bgs and work without personal protective equipment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0 - 4 feet bgs and work without personal protective equipment.
				Construction worker (other)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0-10 feet bgs and work without personal protective equipment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0-10 feet bgs and work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
						Ingestion	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	Quant	Routine workers are assumed to be in contact with vapors/particulates subsurface soils brought to the surface.
				Utility Worker	Adult	Inhalation	On-Site	Quant	Utility workers are assumed to be in contact with vapors/particulates subsurface soils brought to the surface.
				Construction Worker (Slab on grade)	Adult	Inhalation	On-site	Quant	Construction workers are assumed to be in contact with vapors/particulates from subsurface soils brought to the surface and work without personal protective equipment.
				Construction worker (other)	Adult	Inhalation	On-site	Quant	Construction workers are assumed to be in contact with vapors/particulates from subsurface soils brought to the surface and work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Routine Worker	Adult	Dermal	On-Site	Quant	Routine workers are likely come into contact with surface water onsite.
						Ingestion	On-site	Quant	Routine workers are likely come into contact with surface water onsite.
				Utility Worker	Adult	Dermal	On-Site	None	Utility workers are not likely to come into contact with surface water onsite.
						Ingestion	On-site	None	Utility workers are not likely to come into contact with surface water onsite.
	Sediments	Sediments	Sediments	Routine Worker	Adult	Dermal	On-site	Quant	Future routine worker exposures to sediment are possible in Area 2.
						Ingestion	On-site	Quant	Future routine worker exposures to sediment are possible in Area 2.
				Trespasser/Visitor	Adolescent	Dermal	On-site	Quant	Future trespasser/visitor exposures to sediment are possible in Area 2.
						Ingestion	On-site	Quant	Future trespasser/visitor exposures to sediment are possible in Area 2.
	Groundwater	Groundwater	Water from upper aquifer	Routine Worker & Utility Worker	Adult	Dermal	On-Site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water.
						Ingestion	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with water.
				Construction Worker	Adult	Dermal	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), construction workers are not expected to have contact with water.
						Ingestion	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), construction workers are not expected to have contact with water.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected come into contact with upper aquifer water.
						Ingestion	On-site	None	Trespassers are not expected come into contact with upper aquifer water.
		Air	Vapors from upper aquifer	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), workers are not expected to have contact with vapors.
					Adult	Inhalation	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), construction workers are not expected to have contact with vapors.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Routine Worker & Utility Worker	Adult	Dermal	On-Site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
						Ingestion	On-site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Dermal	On-site	None	Construction workers are not expected come into contact with lower aquifer water.
						Ingestion	On-site	None	Construction workers are not expected come into contact with lower aquifer water.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected come into contact with lower aquifer water.
						Ingestion	On-site	None	Trespassers are not expected come into contact with lower aquifer water.

TABLE 3-2  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 2) - Griffith, Indiana

File: table3\_2.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Air	Vapors from lower aquifer	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	Quant	Routine workers and utility workers may come into contact with water vapors from onsite wells in the lower aquifer.
				Construction Worker	Adult	Inhalation	On-site	None	Construction workers are not expected come into contact with vapors from lower aquifer water.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from lower aquifer water.
	Air	Air	Vapor emissions from Area 3	Routine Worker	Adult	Inhalation	On-Site	Qual	Routine workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers may come into contact with vapor emissions from Area 3 soil, but this pathway is not significant.
	Other	Soil	Buried Drums	Routine Worker / Utility Worker	Adult	Dermal	On-Site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable.
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable.
				Construction Worker	Adult	Dermal	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable.
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable.
						Ingestion	On-site	Qual	There is potential for rupture or explosion of buried drums and continuing uncontrolled chemical release. However, this pathway is not easily quantifiable.
		Air	Vapors from buried drums	Routine Worker	Adult	Inhalation	On-Site	Qual	Routine workers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers may come into contact with vapors from buried drums. However, this pathway is not easily quantifiable.

TABLE 3-3  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 3) - Griffith, Indiana

File: table3\_3.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface soil	Surface Soil	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Utility Worker	Adult	Dermal Ingestion	On-Site On-site	Quant Quant	Utility workers may be exposed to soil from 0-10 feet bgs. Utility workers may be exposed to soil from 0-10 feet bgs.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	Quant Quant	Trespassers may gain access to this area of the site and come into contact with surface soil. Trespassers may gain access to this area of the site and come into contact with surface soil.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Utility Worker	Adult	Inhalation	On-Site	Quant	Utility workers may work in this area and come into contact with vapors/ particulates from surface soil.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with vapors/particulates from surface soil.
	Subsurface soil	Subsurface soil	Subsurface soil	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Although trespassers may gain access to the site, it is unlikely they will come into contact with subsurface soil. Although trespassers may gain access to the site, it is unlikely they will come into contact with subsurface soil.
		Air	Vapors / Particulates	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Although trespassers may gain access to the site, it is unlikely they will come into contact with vapors/particulates from subsurface soil.

TABLE 3-3  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 3) - Griffith, Indiana

File: table3\_3.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Water from upper aquifer	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land Current land use is vacant land.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with upper aquifer. Trespassers are not expected to dig more than 2 feet into the ground and come into contact with upper aquifer.
		Air	Vapors from upper aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with vapors/particulates from upper aquifer.
		Groundwater	Water from lower aquifer	Routine Worker	Adult	Dermal Ingestion	On-Site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Trespassers are not expected to come into contact with lower aquifer water. Trespassers are not expected to come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with lower aquifer.
	Air	Air	Vapor emissions from Area 2	Routine Worker	Adult	Inhalation	On-Site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespassers are likely come into contact with vapor emissions from Area 2 soil.

TABLE 3-3  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 3) - Griffith, Indiana

File: table3\_3.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface and subsurface soil	Surface and subsurface soil	Surface and subsurface soil	Routine Worker	Adult	Dermal	On-Site	Quant	Future workers may be exposed to surface and subsurface soil to a depth of 10 feet. It was assumed soil to a two foot depth may be brought to the surface during utility maintenance and construction work and intermixed with the existing surface soil.
						Ingestion	On-site	Quant	Future workers may be exposed to surface and subsurface soil to a depth of 10 feet. It was assumed soil to a two foot depth may be brought to the surface during utility maintenance and construction work and intermixed with the existing surface soil.
				Utility Worker	Adult	Dermal	On-site	Quant	Workers are assumed to be in contact with subsurface soils to a depth of 10 feet.
						Ingestion	On-site	Quant	Workers are assumed to be in contact with subsurface soils to a depth of 10 feet.
				Construction Worker (Slab on Grade)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0 - 4 feet bgs and work without personal protective equipment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0 - 4 feet bgs and work without personal protective equipment.
				Construction worker (other)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0-10 feet bgs and work without personal protective equipment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in contact with subsurface soils 0-10 feet bgs and work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
						Ingestion	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
	Air	Vapors / Particulates		Routine Worker	Adult	Inhalation	On-Site	Quant	Routine workers are assumed to be in contact with vapors/particulates subsurface soils brought to the surface.
				Utility Worker	Adult	Inhalation	On-Site	Quant	Utility workers are assumed to be in contact with vapors/particulates subsurface soils brought to the surface.
				Construction Worker (Slab on grade)	Adult	Inhalation	On-site	Quant	Construction workers are assumed to be in contact with vapors/particulates from subsurface soils brought to the surface and work without personal protective equipment.
				Construction worker (other)	Adult	Inhalation	On-site	Quant	Construction workers are assumed to be in contact with vapors/particulates from subsurface soils brought to the surface and work without personal protective equipment.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.

TABLE 3-3  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 3) - Griffith, Indiana

File: table3\_3.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface Soil	Air	Vapors / Particulates	Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespasser exposures are assumed to occur because soil currently below the surface may be moved to the surface during excavation activities.
	Groundwater	Groundwater	Water from upper aquifer	Routine Worker	Adult	Dermal	On-Site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), Routine workers are not expected to have contact with water.
						Ingestion	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), Routine workers are not expected to have contact with water.
				Construction Worker	Adult	Dermal	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), construction workers are not expected to have contact with water.
						Ingestion	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), construction workers are not expected to have contact with water.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected come into contact with upper aquifer water.
						Ingestion	On-site	None	Trespassers are not expected come into contact with upper aquifer water.
		Air	Vapors from upper aquifer	Routine Worker	Adult	Inhalation	On-Site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), Routine workers are not expected to have contact with vapors.
				Construction Worker	Adult	Inhalation	On-site	None	Due to the depth to the upper groundwater aquifer (10-16 feet), construction workers are not expected to have contact with vapors.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Routine Worker & Utility Worker	Adult	Dermal	On-Site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
						Ingestion	On-site	Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Dermal	On-site	None	Construction workers are not expected come into contact with lower aquifer water.
						Ingestion	On-site	None	Construction workers are not expected come into contact with lower aquifer water.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected come into contact with lower aquifer water.
						Ingestion	On-site	None	Trespassers are not expected come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Routine Worker & Utility Worker	Adult	Inhalation	On-Site	Quant	Routine workers and utility workers may come into contact with water vapors from onsite wells in the lower aquifer.
				Construction Worker	Adult	Inhalation	On-site	None	Construction workers are not expected come into contact with vapors from lower aquifer water.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from lower aquifer water.

TABLE 3-3  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 3) - Griffith, Indiana

File: table3\_3.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Air	Air	Vapor emissions from Area 2	Routine Worker	Adult	Inhalation	On-Site	Qual	Workers are likely come into contact with vapor emissions from Area 2 soil, but this pathway is not significant.
				Construction Worker	Adult	Inhalation	On-site	Qual	Construction workers are likely come into contact with vapor emissions from Area 2 soil, but this pathway is not significant.
		Air	Vapor emissions from Area 2	Trespasser/Visitor	Adolescents	Inhalation	On-site	Qual	Trespassers maycome into contact with vapor emissions from Area 2 soil, but this pathway is not significant.



TABLE 3-4  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 4A) - Griffith, Indiana

File: table3\_4.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Sediment/Surface Soil	Surface soil	Sediment/Surface Soil	Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with surface soil.
						Ingestion	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with surface soil.
		Air	Vapors / Particulates	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Emission of vapors is expected to be primarily from surface water. Particulates are not expected due to the presence of surface water.
	Subsurface soil	Subsurface soil	Subsurface soil	Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with subsurface soil.
						Ingestion	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with subsurface soil.
		Air	Vapors / Particulates	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with vapors/particulates from subsurface soil.
	Groundwater	Groundwater	Water from upper aquifer	Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to come into contact with upper aquifer water.
						Ingestion	On-site	None	Trespassers are not expected to come into contact with upper aquifer water.
		Air	Vapors from upper aquifer	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to come into contact with lower aquifer water.
						Ingestion	On-site	None	Trespassers are not expected to come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with vapors from lower aquifer water.
	Surface Water	Surface Water	Surface water in wetlands	Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers are likely to come into contact with surface water onsite.
						Ingestion	On-site	Quant	Trespassers are likely to come into contact with surface water onsite.
		Air	Vapors from surface water	Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespassers are likely come into contact with vapor emissions from surface water.
		Animal Tissue	Fish	Trespasser/Visitor	Adolescents	Ingestion	On-site	None	Wetlands in Area 4A do not support fish populations.

TABLE 3-4  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 4A) - Griffith, Indiana

File: table3\_4.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Sediment/Surface Soil	Surface soil	Sediment/Surface Soil	Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with surface soil.
						Ingestion	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with surface soil.
		Air	Vapors / Particulates	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Emission of vapors is expected to be primarily from surface water. Particulates are not expected due to the presence of surface water.
	Subsurface soil	Subsurface soil	Subsurface soil	Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with subsurface soil.
						Ingestion	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with subsurface soil.
		Air	Vapors / Particulates	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to dig more than 2 feet into the ground and come into contact with vapors/particulates from subsurface soil.
	Groundwater	Groundwater	Water from upper aquifer	Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to come into contact with upper aquifer water.
						Ingestion	On-site	None	Trespassers are not expected to come into contact with upper aquifer water.
		Air	Vapors from upper aquifer	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to come into contact with lower aquifer water.
						Ingestion	On-site	None	Trespassers are not expected to come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with vapors from lower aquifer water.
	Surface Water	Surface Water	Surface water in wetlands	Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers are likely to come into contact with surface water onsite.
						Ingestion	On-site	Quant	Trespassers are likely to come into contact with surface water onsite.
		Air	Vapors from surface water	Trespasser/Visitor	Adolescents	Inhalation	On-site	Quant	Trespassers are likely to come into contact with vapor emissions from surface water.
		Animal Tissue	Fish	Trespasser/Visitor	Adolescents	Ingestion	On-site	None	Wetlands in Area 4A do not support fish populations.

TABLE 3-5  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 4B) - Griffith, Indiana

File: table3\_5.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Sediment	Sediment	Sediment	Utility Worker	Adult	Dermal Ingestion	On-site On-site	Quant Quant	Utility workers are expected to engage in activities that would place them in direct contact with sediment. Utility workers are expected to engage in activities that would place them in direct contact with sediment.
				Routine Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	Quant Quant	Trespassers may gain access to this area of the site and come into contact with sediment. Trespassers may gain access to this area of the site and come into contact with sediment.
		Air	Vapors / Particulates	Utility Worker	Adult	Inhalation	On-site	None	Utility workers are assumed to be in contact with sediment; however, contact with vapor/particulate emissions is considered insignificant.
				Routine Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are assumed to be in contact with sediment; however, contact with vapor/particulate emissions is considered insignificant.
	Groundwater	Groundwater	Water from upper aquifer	Routine Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Utility Worker	Adult	Dermal Ingestion	On-site On-site	Quant None	Utility workers are expected to engage in activities that would place them in contact with upper aquifer water. Utility workers are not expected to ingest water from the upper aquifer.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Current land use is vacant land. Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Trespassers are not expected to come into contact with upper aquifer water. Trespassers are not expected to come into contact with upper aquifer water.

TABLE 3-5  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 4B) - Griffith, Indiana

File: table3\_5.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Air	Vapors from upper aquifer	Utility Worker	Adult	Inhalation	On-Site	Quant	Utility workers are assumed to work without personal protective equipment and may inhale vapors from upper aquifer water.
				Routine Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to come into contact with vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Routine Worker	Adult	Dermal	On-site	None	Current land use is vacant land.
						Ingestion	On-site	None	Current land use is vacant land.
				Construction Worker	Adult	Dermal	On-site	None	Current land use is vacant land.
						Ingestion	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected come into contact with lower aquifer water.
						Ingestion	On-site	None	Trespassers are not expected come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Routine Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Construction Worker	Adult	Inhalation	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from lower aquifer water.
	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Routine Worker	Adult	Dermal	On-site	None	Current land use is vacant land.
						Ingestion	On-site	None	Current land use is vacant land.
				Construction Worker	Adult	Dermal	On-site	None	Current land use is vacant land.
						Ingestion	On-site	None	Current land use is vacant land.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers are likely to come into contact with surface water onsite.
						Ingestion	On-site	Quant	Trespassers are likely to come into contact with surface water onsite.
				Utility Worker	Adult	Dermal	On-site	Qual	Utility workers are expected to have minimal contact with surface water onsite.
						Ingestion	On-site	Qual	Utility workers are expected to have minimal contact with surface water onsite.

TABLE 3-5  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 4B) - Griffith, Indiana

File: table3\_5.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Sediment	Sediment	Sediment	Routine Worker & Utility Worker	Adult	Dermal	On-site	Quant	Workers are assumed to be in this area of the site and exposed to sediment.
						Ingestion	On-site	Quant	Workers are assumed to be in this area of the site and exposed to sediment.
				Construction Worker (Slab on Grade)	Adult	Dermal	On-site	Quant	Construction workers are assumed to be in this area of the site and exposed to sediment.
						Ingestion	On-site	Quant	Construction workers are assumed to be in this area of the site and exposed to sediment.
				Trespasser/Visitor	Adolescents	Dermal	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with sediment.
						Ingestion	On-site	Quant	Trespassers may gain access to this area of the site and come into contact with sediment.
		Air	Vapors / Particulates	Routine / Utility Worker	Adult	Inhalation	On-Site	None	Workers are assumed to be in this area of the site and exposed to sediment; however, direct contact with vapor/particulate emissions is considered insignificant.
				Construction Worker	Adult	Inhalation	On-site	None	Construction workers are assumed to be in this area of the site and exposed to sediment; however, direct contact with vapor/particulate emissions is considered insignificant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are assumed to be in this area of the site and exposed to sediment; however, direct contact with vapor/particulate emissions is considered insignificant.
	Groundwater	Groundwater	Water from upper aquifer	Utility Worker	Adult	Dermal	On-site	Quant	Utility workers are expected to engage in activities that would place them in contact with upper aquifer groundwater.
						Ingestion	On-site	None	Utility workers are not expected to engage ingest upper aquifer groundwater.
				Construction Worker	Adult	Dermal	On-site	Quant	Construction workers are assumed to work without personal protective equipment and may contact upper aquifer water.
						Ingestion	On-site	None	Construction workers are not expected to ingest water from the upper aquifer.
				Trespasser/Visitor	Adolescents	Dermal	On-site	None	Trespassers are not expected to engage in intrusive activities that would place them in contact with upper aquifer groundwater.
						Ingestion	On-site	None	Trespassers are not expected to engage in intrusive activities that would place them in contact with upper aquifer groundwater.
		Air	Vapors from upper aquifer	Utility Worker	Adult	Inhalation	On-site	Quant	Utility workers are assumed to inhale vapors from upper aquifer groundwater.
				Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers are assumed to work without personal protective equipment and may inhale vapors from upper aquifer water.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected to be exposed to vapors from upper aquifer groundwater while onsite.

TABLE 3-5  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 4B) - Griffith, Indiana

File: table3\_5.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	Water from lower aquifer	Routine Worker & Utility Worker	Adult	Dermal Ingestion	On-Site On-site	Quant Quant	Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer. Routine workers and utility workers may come into contact with water from onsite wells in the lower aquifer.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Construction workers are not expected come into contact with lower aquifer water. Construction workers are not expected come into contact with lower aquifer water.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	None None	Trespassers are not expected come into contact with lower aquifer water. Trespassers are not expected come into contact with lower aquifer water.
		Air	Vapors from lower aquifer	Routine Worker & Utility Worker	Adult	Inhalation	On-site	Quant	Routine workers and utility workers are assumed to inhale vapors associated with showering using lower aquifer groundwater.
				Construction Worker	Adult	Inhalation	On-site	None	Construction workers are not expected come into contact with vapors from lower aquifer water.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are not expected come into contact with vapors from lower aquifer water.
	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Routine Worker	Adult	Dermal Ingestion	On-site On-site	Quant Quant	Routine workers are likely come into contact with surface water onsite. Routine workers are likely come into contact with surface water onsite.
				Construction Worker	Adult	Dermal Ingestion	On-site On-site	None None	Construction workers are not expected to come into contact with onsite surface water. Construction workers are not expected to come into contact with onsite surface water.
				Trespasser/Visitor	Adolescents	Dermal Ingestion	On-site On-site	Quant Quant	Trespassers are likely come into contact with surface water onsite. Trespassers are likely come into contact with surface water onsite.
		Air	Vapors from surface water	Routine Worker	Adult	Inhalation	On-site	None	Routine workers are likely to come into contact with surface water onsite; however, contact with vapors/emissions in this area are considered insignificant.
				Construction Worker	Adult	Inhalation	On-site	None	Construction workers are likely to come into contact with surface water onsite; however, contact with vapors/emissions in this area are considered insignificant.
				Trespasser/Visitor	Adolescents	Inhalation	On-site	None	Trespassers are likely to come into contact with surface water onsite; however, contact with vapors/emissions in this area are considered insignificant.

TABLE 3-6  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 5A) - Griffith, Indiana

File: table3\_6.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface soil	Surface Soil	Resident	Adult	Dermal	Off-Site	Quant	Adult residents may have direct contact with surface soil.
						Ingestion	Off-Site	Quant	Adult residents may have direct contact with surface soil.
					Child	Dermal	Off-Site	Quant	Child residents may have direct contact with surface soil.
						Ingestion	Off-Site	Quant	Child residents may have direct contact with surface soil.
	Air	Air	Off-Site Areas	Resident	Adult	Inhalation	Off-Site	Quant	Adult residents may inhale vapors emitted from surface soil in Areas 2 and 3 and particulates from Areas 1, 2, 3, and 4B.
					Child	Inhalation	Off-Site	Quant	Child residents may inhale vapors emitted from surface soil in Areas 2 and 3 and particulates from Areas 1, 2, 3, and 4B.
	Subsurface soil	Subsurface soil	Subsurface soil	Resident	Adult	Dermal	Off-Site	None	Subsurface soil data does not exist.
						Ingestion	Off-Site	None	Subsurface soil data does not exist.
					Child	Dermal	Off-Site	None	Subsurface soil data does not exist.
						Ingestion	Off-Site	None	Subsurface soil data does not exist.
	Air	Air	Off-Site Areas	Resident	Adult	Inhalation	Off-Site	Quant	Adult residents may inhale vapors and particulates emitted from subsurface soil in Areas 2 and 3.
					Child	Inhalation	Off-Site	Quant	Child residents may inhale vapors and particulates emitted from subsurface soil in Areas 2 and 3.
	Groundwater	Groundwater	Water from upper aquifer	Resident	Adult	Dermal	Off-Site	Quant	Adult residents may have direct contact with upper aquifer water while washing cars or watering lawns assuming wells are installed in the upper aquifer.
						Ingestion	Off-Site	Quant	Adult residents may have direct contact with upper aquifer water while washing cars or watering lawns assuming wells are installed in the upper aquifer.
					Child	Dermal	Off-Site	Quant	Child residents may have direct contact with upper aquifer water while swimming assuming wells are installed in the upper aquifer.
						Ingestion	Off-Site	Quant	Child residents may have direct contact with upper aquifer water while swimming assuming wells are installed in the upper aquifer.

TABLE 3-6  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 5A) - Griffith, Indiana

File: table3\_6.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Water from lower aquifer	Resident	Adult	Dermal	Off-Site	Quant	Adult residents adjacent to the site currently use wells installed in the lower aquifer for drinking and general household purposes.
						Ingestion	Off-Site	Quant	Adult residents adjacent to the site currently use wells installed in the lower aquifer for drinking and general household purposes.
					Child	Dermal	Off-Site	Quant	Child residents adjacent to the site currently use wells installed in the lower aquifer for drinking and general household purposes.
						Ingestion	Off-Site	Quant	Child residents adjacent to the site currently use wells installed in the lower aquifer for drinking and general household purposes.
		Air	Vapors from lower aquifer	Resident	Adult	Inhalation	Off-Site	Quant	Adult residents adjacent to the site currently use wells installed in the lower aquifer for drinking and general household purposes.
					Child	Inhalation	Off-Site	Quant	Child residents adjacent to the site currently use wells installed in the lower aquifer for drinking and general household purposes.
	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Resident	Adult	Dermal	Off-Site	None	Adult residents are not expected to have direct contact with surface water.
						Ingestion	Off-Site	None	Adult residents are not expected to have direct contact with surface water.
					Child	Dermal	Off-Site	None	Child residents are not expected to have direct contact with surface water.
						Ingestion	Off-Site	None	Child residents are not expected to have direct contact with surface water.
	Other	Soil	Garden fruits and vegetables	Resident	Adult	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to adult residents.
					Child	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to child residents.
Future	Surface soil	Surface soil	Surface Soil	Resident	Adult	Dermal	Off-Site	Quant	Adult residents may have direct contact with surface soil.
						Ingestion	Off-Site	Quant	Adult residents may have direct contact with surface soil.
					Child	Dermal	Off-Site	Quant	Child residents may have direct contact with surface soil.
						Ingestion	Off-Site	Quant	Child residents may have direct contact with surface soil.
	Air	Air	Vapor emissions from Area 2 and Area 3	Resident	Adult	Inhalation	Off-Site	Quant	Adult residents may inhale vapors emitted from surface soil in Areas 2 and 3.
					Child	Inhalation	Off-Site	Quant	Child residents may inhale vapors emitted from surface soil in Areas 2 and 3.



TABLE 3-6  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 5A) - Griffith, Indiana

File: table3\_6.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface Soil	Subsurface soil	Subsurface soil	Resident	Adult	Dermal	Off-Site	None	No subsurface soil data exists.
						Ingestion	Off-Site	None	No subsurface soil data exists.
					Child	Dermal	Off-Site	None	No subsurface soil data exists.
						Ingestion	Off-Site	None	No subsurface soil data exists.
	Air	Air	Emissions from On-Site Areas	Resident	Adult	Inhalation	Off-Site	Quant	Adult residents may inhale vapors emitted from subsurface soil in Areas 2 and 3.
					Child	Inhalation	Off-Site	Quant	Child residents may inhale vapors emitted from subsurface soil in Areas 2 and 3.
	Groundwater	Groundwater	Water from upper aquifer	Resident	Adult	Dermal	Off-Site	Quant	Adult residents may use upper aquifer water for washing cars or watering lawns assuming wells are installed in the upper aquifer.
						Ingestion	Off-Site	Quant	Adult residents may use upper aquifer water for washing cars or watering lawns assuming wells are installed in the upper aquifer.
					Child	Dermal	Off-Site	Quant	Child residents may use upper aquifer water for swimming assuming wells are installed in the upper aquifer.
						Ingestion	Off-Site	Quant	Child residents may use upper aquifer water for swimming assuming wells are installed in the upper aquifer.
			Water from lower aquifer	Resident	Adult	Dermal	Off-Site	Quant	Adult residents adjacent to the site are assumed to use wells installed in the lower aquifer for drinking and general household purposes. Data from lower aquifer wells are used to estimate exposure, and data from upper aquifer wells will be used as a bounding estimate.
						Ingestion	Off-Site	Quant	Adult residents adjacent to the site are assumed to use wells installed in the lower aquifer for drinking and general household purposes. Data from lower aquifer wells are used to estimate exposure, and data from upper aquifer wells will be used as a bounding estimate.
					Child	Dermal	Off-Site	Quant	Child residents adjacent to the site are assumed to use wells installed in the lower aquifer for drinking and general household purposes. Data from lower aquifer wells are used to estimate exposure, and data from upper aquifer wells will be used as a bounding estimate.
						Ingestion	Off-Site	Quant	Child residents adjacent to the site are assumed to use wells installed in the lower aquifer for drinking and general household purposes. Data from lower aquifer wells are used to estimate exposure, and data from upper aquifer wells will be used as a bounding estimate.

TABLE 3-6  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 5A) - Griffith, Indiana

File: table3\_6.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Air	Vapors from lower aquifer	Resident	Adult	Inhalation	Off-Site	Quant	Adult residents adjacent to the site are assumed to use wells installed in the lower aquifer for drinking and general household purposes. Data from lower aquifer wells are used to estimate exposure, and data from upper aquifer wells will be used as a bounding estimate.
					Child	Inhalation	Off-Site	Quant	Child residents adjacent to the site are assumed to use wells installed in the lower aquifer for drinking and general household purposes. Data from lower aquifer wells are used to estimate exposure, and data from upper aquifer wells will be used as a bounding estimate.
	Surface Water	Surface Water	Pond, Drainage ditch, Puddles	Resident	Adult	Dermal	Off-Site	None	Adult residents are not expected to have direct contact with surface water.
						Ingestion	Off-Site	None	Adult residents are not expected to have direct contact with surface water.
	Other	Soil	Garden fruits and vegetables	Resident	Adult	Dermal	Off-Site	None	Child residents are not expected to have direct contact with surface water.
						Ingestion	Off-Site	None	Child residents are not expected to have direct contact with surface water.
					Adult	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to adult residents.
					Child	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to child residents.

TABLE 3-7  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 5B) - Griffith, Indiana

File: table3\_7.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Water from upper aquifer	Construction Worker	Adult	Dermal  Ingestion	Off-Site  Off-Site	None  None	The current land use is vacant land.  The current land use is vacant land.
		Air	Vapors from upper aquifer	Construction Worker	Adult	Inhalation	Off-Site	None	The current land use is vacant land.
		Groundwater	Water from lower aquifer	Commercial Worker	Adult	Dermal  Ingestion	Off-Site  Off-Site	None  None	There are no commercial workers using groundwater currently in this area of the site. There are no commercial workers using groundwater currently in this area of the site.
		Air	Vapors from lower aquifer	Commercial Worker	Adult	Inhalation	Off-Site	None	There are no commercial workers using groundwater currently in this area of the site.
Future	Groundwater	Groundwater	Water from upper aquifer	Construction Worker	Adult	Dermal  Ingestion	Off-Site  Off-Site	Quant  None	Construction workers are assumed to work without personal protective equipment and may contact upper aquifer water. Construction workers are not expected to ingest water from the upper aquifer.
		Air	Vapors from upper aquifer	Construction Worker	Adult	Inhalation	Off-Site	Quant	Construction workers are assumed to work without personal protective equipment and may inhale vapors from upper aquifer water.
		Groundwater	Water from lower aquifer	Commercial Worker	Adult	Dermal  Ingestion	Off-Site  Off-Site	Quant  None	Future commercial uses of lower aquifer (car wash, etc.) are possible. Future commercial users are not expected to use groundwater for ingestion.
		Air	Vapors from lower aquifer	Commercial Worker	Adult	Inhalation	Off-Site	Quant	Future commercial uses of lower aquifer (car wash, etc.) are possible.

TABLE 3-8  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 6) - Griffith, Indiana

File: table3\_8.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Sediment	Sediment	Sediment	Resident	Adult	Dermal Ingestion	Off-Site Off-Site	Quant Quant	Adult residents could have direct contact with sediment that washes from Area 4A. Adult residents could have direct contact with sediment that washes from Area 4A.
					Child	Dermal Ingestion	Off-Site Off-Site	Quant Quant	Child residents could have direct contact with sediment that washes from Area 4A. Child residents could have direct contact with sediment that washes from Area 4A.
		Air	Vapors from sediment	Resident	Adult	Inhalation	Off-Site	None	The inhalation of vapors emitted from sediment in Area 4A is expected to be insignificant to Area 6 residents.
					Child	Inhalation	Off-Site	None	The inhalation of vapors emitted from sediment in Area 4A is expected to be insignificant to Area 6 residents.
	Surface Water	Surface Water	Stream	Resident	Adult	Dermal Ingestion	Off-Site Off-Site	Qual Qual	Adult residents are likely to have direct contact with surface water; however, the surface water is not contaminated. Adult residents are likely to have direct contact with surface water; however, the surface water is not contaminated.
					Child	Dermal Ingestion	Off-Site Off-Site	Qual Qual	Child residents are likely to have direct contact with surface water; however, the surface water is not contaminated. Child residents are likely to have direct contact with surface water; however, the surface water is not contaminated.
		Air	Vapors from surface water	Resident	Adult	Inhalation	Off-Site	None	The inhalation of vapors emitted from surface water in Area 4A is expected to be insignificant to Area 6 residents.
					Child	Inhalation	Off-Site	None	The inhalation of vapors emitted from surface water in Area 4A is expected to be insignificant to Area 6 residents.
	Other	Soil	Garden fruits and vegetables	Resident	Adult	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to adult residents.
					Child	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to child residents.
Future	Sediment	Sediment	Sediment	Resident	Adult	Dermal Ingestion	Off-Site Off-Site	Quant Quant	Adult residents could have direct contact with sediment that washes from Area 4A. Adult residents could have direct contact with sediment that washes from Area 4A.
					Child	Dermal Ingestion	Off-Site Off-Site	Quant Quant	Child residents could have direct contact with sediment that washes from Area 4A. Child residents could have direct contact with sediment that washes from Area 4A.
		Air	Vapors from sediment	Resident	Adult	Inhalation	Off-Site	None	The inhalation of vapors emitted from sediment in Area 4A is expected to be insignificant to Area 6 residents.
					Child	Inhalation	Off-Site	None	The inhalation of vapors emitted from sediment in Area 4A is expected to be insignificant to Area 6 residents.

TABLE 3-8  
SELECTION OF EXPOSURE PATHWAYS  
American Chemical Services Site (Area 6) - Griffith, Indiana

File: table3\_8.WK4

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Water	Surface Water	Stream	Resident	Adult	Dermal	Off-Site	Qual	Adult residents are likely to have direct contact with surface water; however, the surface water is not contaminated.
						Ingestion	Off-Site	Qual	Adult residents are likely to have direct contact with surface water; however, the surface water is not contaminated.
					Child	Dermal	Off-Site	Qual	Child residents are likely to have direct contact with surface water; however, the surface water is not contaminated.
						Ingestion	Off-Site	Qual	Child residents are likely to have direct contact with surface water; however, the surface water is not contaminated.
		Air	Vapors from surface water	Resident	Adult	Inhalation	Off-Site	None	The inhalation of vapors emitted from surface water in Area 4A is expected to be insignificant to Area 6 residents.
					Child	Inhalation	Off-Site	None	The inhalation of vapors emitted from surface water in Area 4A is expected to be insignificant to Area 6 residents.
	Other	Soil	Garden fruits and vegetables	Resident	Adult	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to adult residents.
					Child	Ingestion	Off-Site	None	This pathway is not considered to pose a substantial risk to child residents.

Table 3-9  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Soil  
Exposure Medium: Soil  
Exposure Point: Area 2, Soil  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: TARA3\_10.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Ingestion Rate of Soil	mg/day	50	USEPA 1991, 97 (1)	25	USEPA 1991, 97 (2)	$CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	--	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	USEPA 1993	2	USEPA 1993	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,129	USEPA 1991	183	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) =
	SSAF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	$CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	4,400	USEPA 1992	3,600	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	USEPA 1993	2	USEPA 1993	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	2,129	USEPA, 1991	183	USEPA, 1991	

(1) Assume a Prorated Ingestion Rate for soil and sediment in Area 2. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that a trespasser ingests a total of 50 mg of soil per day.

(2) Assume a Prorated Ingestion Rate for soil and sediment in Area 2. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that a trespasser ingests a total of 25 mg of soil per day.

(3) Assume 1 day/week in April, May, Sept, Oct, and 3 days/week in June, July, and August.

(4) Assume 1 day/week in June, July, and August.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-10  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Area 3, Soil
Receptor Population: Trespasser
Receptor Age: Adolescent

File: TARA3\_10.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	100	USEPA 1991, 97 (1)	50	USEPA 1991, 97 (1)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	--	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	54	(2)	12	(3)	
	ED	Exposure Duration	years	10	USEPA 1993	2	USEPA 1993	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,129	USEPA 1991	183	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm2-event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm2	4,400	USEPA 1992	3,600	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	54	(2)	12	(3)	
	ED	Exposure Duration	years	10	USEPA 1993	2	USEPA 1993	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	2,129	USEPA, 1991	183	USEPA, 1991	

(1) No sediment in Area 3; therefore, the soil ingestion rate in this area was not prorated.

(2) Assume 1 day/week in April, May, Sept, Oct, and 3 days/week in June, July, and August.

(3) Assume 1 day/week in June, July, and August.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-11  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Soil  
Exposure Point: Area 1, Soil  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: TARA3\_16.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	50	USEPA 1991, 97, (1)	25	USEPA 1991, 97, (2)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	--	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	USEPA 1993	2	USEPA 1993	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,129	USEPA 1991	183	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	4,400	USEPA 1992	3,600	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	USEPA 1993	2	USEPA 1993	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	2,129	USEPA, 1991	183	USEPA, 1991	

- (1) Assume a Prorated Ingestion Rate for soil and sediment in Area 1. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that a trespasser ingests a total of 50 mg of soil per day.
- (2) Assume a Prorated Ingestion Rate for soil and sediment in Area 1. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that a trespasser ingests a total of 25 mg of soil per day.
- (3) Assume 1 day/week in April, May, Sept, Oct, and 3 days/week in June, July, and August.
- (4) Assume 1 day/week in June, July, and August.

Source:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.



Table 3-12  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil [Ambient Air (Vapors/particulates)]
Exposure Point: Area 2, Soil
Receptor Population: Trespasser
Receptor Age: Adolescent

File: tara3\_19.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Inhalation	CA	COPC Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	ET	Exposure Time	hr/hr in day	2/24	(1)	1/24	(2)	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	BW	Body Weight	kg	50	USEPA 1997	50	USEPA 1997	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

- (1) Assume that one-half of a trespasser's exposure time while in Area 2 is in soil and the other half is in sediment. Therefore, assume that the trespasser contacts soil a total of 2 hrs/day.
- (2) Assume that one-half of a trespasser's exposure time while in Area 2 is in soil and the other half is in sediment. Therefore, assume that the trespasser contacts soil a total of 1 hr/day.
- (3) Assume 1 day/week in April, May, September, October, and 3 days/week in June, July, and August.
- (3) Assume 1 day/week in June, July, and August.
- (5) Professional Judgment.

Sources:

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1997: Exposure Factors Handbook. August

Table 3-13  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Soil  
Exposure Medium: Soil [Ambient Air (Vapors/particulates)]  
Exposure Point: Area 3, Soil  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: tara3\_19.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	COPC Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	$CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	ET	Exposure Time	hr/hr in day	4/24	(1)	2/24	(1)	
	EF	Exposure Frequency	days/year	54	(1)	12	(1)	
	ED	Exposure Duration	years	10	(2)	2	(2)	
	BW	Body Weight	kg	50	USEPA 1997	50	USEPA 1997	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

(1) USEPA Region V Standard default trespasser scenario.

(2) Professional Judgment.

Sources:

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1997: Exposure Factors Handbook. August

Table 3-14  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil [Ambient Air (Vapors/particulates)]
Exposure Point: Area 1, Soil
Receptor Population: Trespasser
Receptor Age: Adolescent

File: tara3\_19.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	$CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	ET	Exposure Time	hr/hr in day	2/24	(1)	1/24	(2)	
	EF	Exposure Frequency	days/year	54	(3)	12	(3)	
	ED	Exposure Duration	years	10	(4)	2	(4)	
	BW	Body Weight	kg	50	USEPA 1997	50	USEPA 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

(1) Assume that one-half of a trespasser's exposure time while in Area 1 is in soil and the other half is in sediment. Therefore, assume that the trespasser contacts soil a total of 2 hrs/day.

(2) Assume that one-half of a trespasser's exposure time while in Area 1 is in soil and the other half is in sediment. Therefore, assume that the trespasser contacts soil a total of 1 hr/day.

(3) USEPA Region V Standard default trespasser scenario.

(4) Professional Judgment.

Sources:

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1997: Exposure Factors Handbook. August

**Table 3-15**  
**Values Used For Daily Intake Calculations**  
**American Chemical Service NPL Site**

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Area 2, Sediment
Receptor Population: Trespasser
Receptor Age: Adolescent

File: lara3\_32.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) =  CS x IR x CF x FI x EF x ED x 1 /BW x 1/AT
	IR	Ingestion Rate	mg/day	50	USEPA 1991 (1)	25	USEPA 1991 (2)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	CDI (mg/kg-day) =  CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	4,400	USEPA 1992	3,600	USEPA 1992	
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

(1) Assume a Prorated Ingestion Rate for soil and sediment in Area 2. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that the trespasser ingests a total of 50 mg of sediment per day.

(2) Assume a Prorated Ingestion Rate for soil and sediment in Area 2. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that the trespasser ingests a total of 25 mg of sediment per day.

(3) Assume one day per week in April, May, September and October and three days per week during June, July and August.

(4) Assume one day per week in June, July, and August.

(5) Professional judgment.

**Sources:**

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-16  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Area 4A and 4B, Sediment  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: tara3\_35.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1/AT$
	IR	Ingestion Rate	mg/day	100	USEPA 1991 (1)	50	USEPA 1991 (1)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	54	(2)	12	(3)	
	ED	Exposure Duration	years	10	(4)	2	(4)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	4,400	USEPA 1992	3,600	USEPA 1992	
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	54	(2)	12	(3)	
	ED	Exposure Duration	years	10	(4)	2	(4)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

(1) No soil samples in Area 4A or 4B; therefore, the sediment ingestion rate in these areas was not prorated.

(2) Assume one day per week in April, May, September and October and three days per week in June, July and August.

(3) Assume one day per week in June, July, and August.

(4) Professional judgment.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

**Table 3-17**  
**Values Used For Daily Intake Calculations**  
**American Chemical Service NPL Site**

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Area 1, Sediment  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: tar3\_29.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1 / AT$
	IR	Ingestion Rate	mg/day	50	USEPA 1991 (1)	25	USEPA 1991 (2)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1 / BW \times 1 / AT$
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	4,400	USEPA 1992	3,600	USEPA 1992	
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	54	(3)	12	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

- (1) Assume a Prorated Ingestion Rate for soil and sediment in Area 1. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that the trespasser will ingest a total of 50 mg of sediment per day.
- (2) Assume a Prorated Ingestion Rate for soil and sediment in Area 1. Assume that one-half of the exposure time is in soil and the other half is in sediment. Therefore, assume that the trespasser will ingest a total of 25 mg of sediment per day.
- (3) Assume one day per week in April, May, September and October and three days per week in June, July and August.
- (4) Assume one day per week in June, July, and August.
- (5) Professional judgment.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

**Table 3-18**  
**Values Used For Daily Intake Calculations**  
**American Chemical Service NPL Site**

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Area 2, Surface Water
Receptor Population: Trespasser
Receptor Age: Adolescent

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) =  $CW \times CR \times ET \times EF \times ED \times 1 / BW \times 1 / AT$
	CR	Contact Rate	L/hr	0.05	USEPA 1989	0.05	USEPA 1989	
	ET	Exposure Time	hr/day	2	(1)	1	(2)	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	
Dermal	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) =  $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1 / BW \times 1 / AT$
	ET	Exposure Time	hr/day	2	(1)	1	(2)	
	PC	Permeability Constant	cm/hr	chemical specific		chemical specific		
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	4,400	USEPA 1992	3,600	USEPA 1992	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(5)	
	CF	Conversion Factor	L/cm <sup>3</sup>	0.001	USEPA 1989	0.001	USEPA 1989	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	USEPA 1991	183	USEPA 1991	

(1) Assume that one-half of the exposure time in Area 2 is in soil and the other half is in surface water. Therefore, assume that the trespasser will contact surface water for 2 hr/day.

(2) Assume that one-half of the exposure time in Area 2 is in soil and the other half is in surface water. Therefore, assume that the trespasser will contact surface water for 1 hr/day.

(3) Assume once a week in June, July, and August.

(4) Assume once a month in June, July, and August.

(5) Professional judgment.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-19  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Areas 4A and 4B, Surface Water  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: tara3\_41.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CW \times CR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CR	Contact Rate	L/hr	0.05	USEPA 1989	0.05	USEPA 1989	
	ET	Exposure Time	hr/day	4	(1)	2	(2)	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(6)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	(7)	183	(8)	
Dermal	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1/BW \times 1/AT$
	ET	Exposure Time	hr/day	2	(1)	1	(2)	
	PC	Permeability Constant	cm/hr	chemical specific		chemical specific		
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	4,400	USEPA 1992	3,600	USEPA 1992	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(6)	
	CF	Conversion Factor	L/cm <sup>3</sup>	0.001	USEPA 1989	0.001	USEPA 1989	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	(7)	183	(8)	

- (1) Assume that the trespasser will contact surface water in Areas 4A and 4B for 4 hours/day since surface soil is not evaluated in these areas.
- (2) Assume that the trespasser will contact surface water in Areas 4A and 4B for 2 hours/day since surface soil is not evaluated in these areas.
- (3) Assume once a week during the summer months.
- (4) Assume once a month during the summer months.
- (5) Assume 10 years based on the total years in the 9-18 year old age group.
- (6) The CT exposure is assumed to be much less than the RME exposure. In addition the availability of nearby recreational areas makes trespassing at the site less likely.
- (7) Assume to occur 7 months out of the year for 10 years.
- (8) Assume to occur 3 months out of the year for 2 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.



Table 3-19A  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Air
Exposure Point: Area 4A, Surface Water
Receptor Population: Trespasser
Receptor Age: Adolescent

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CW	COPC Concentration in Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CW \times K \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	IR	Inhalation Rate	m3/hr	0.83	USEPA 1991	0.83	USEPA 1991	
	ET	Exposure Time	hr/day	4	(1)	2	(2)	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(6)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	(7)	183	(8)	

- (1) Assume that the trespasser will contact surface water in Area 4A for 4 hours/day since surface soil is not evaluated in these areas.
- (2) Assume that the trespasser will contact surface water in Area 4A for 2 hours/day since surface soil is not evaluated in these areas.
- (3) Assume once a week during the summer months.
- (4) Assume once a month during the summer months.
- (5) Assume 10 years based on the total years in the 9-18 year old age group.
- (6) The CT exposure is assumed to be much less than the RME exposure. In addition the availability of nearby recreational areas makes trespassing at the site less likely.
- (7) Assume to occur 7 months out of the year for 10 years.
- (8) Assume to occur 3 months out of the year for 2 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-20  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 1, Surface Water  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: tara3\_38.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CW \times CR \times ET \times EF \times ED \times 1 / BW \times 1 / AT$
	CR	Contact Rate	L/hr	0.05	USEPA 1989	0.05	USEPA 1989	
	ET	Exposure Time	hr/day	2	(1)	1	(2)	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(6)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	(7)	183	(8)	
Dermal	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1 / BW \times 1 / AT$
	ET	Exposure Time	hr/day	2	(1)	1	(2)	
	PC	Permeability Constant	cm/hr	chemical specific		chemical specific		
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	4,400	USEPA 1992	3,600	USEPA 1992	
	EF	Exposure Frequency	days/year	12	(3)	3	(4)	
	ED	Exposure Duration	years	10	(5)	2	(6)	
	CF	Conversion Factor	L/cm <sup>3</sup>	0.001	USEPA 1989	0.001	USEPA 1989	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	2,129	(7)	183	(8)	

- (1) Assume that one-half of the exposure time is in soil and the other half is in surface water. Therefore, assume that the trespasser will contact surface water for 2 hr/day.
- (2) Assume that one-half of the exposure time is in soil and the other half is in surface water. Therefore, assume that the trespasser will contact surface water for 1 hr/day.
- (3) Assume once a week during the summer months.
- (4) Assume once a month during the summer months.
- (5) Assume 10 years based on the total years in the 9-18 year old age group.
- (6) The CT exposure is assumed to be much less than the RME exposure. In addition the availability of nearby recreational areas makes trespassing at the site less likely.
- (7) Assume to occur 7 months out of the year for 10 years.
- (8) Assume to occur 3 months out of the year for 2 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.  
USEPA 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-21  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Soil  
Exposure Point: Area 1, Surface Soil (0' to 2')  
Receptor Population: Routine worker  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	87.5	USEPA 1991, 97	43.75	USEPA 1991, 97	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	- -	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1991	1,825	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm2-event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm2	5,800	USEPA 1992	5,000	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	9,125	USEPA, 1991	1,825	USEPA, 1991	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-22  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil [Ambient Air (Vapors/particulates)]
Exposure Point: Area 1, Surface Soil (0' to 2')
Receptor Population: Routine worker
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	ET	Exposure Time	hr/8-hr workday	7/8	USEPA 1991, (1)	7/8	USEPA 1991, (1)	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

(1) Assume worker is in contact with soil for 7 hours out of the 8-hour workday (see Section 3.4.8.1).

Sources:

USEPA, 1989: *Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A.* OERR. EPA/540/1-89/002.

USEPA, 1991: *Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors.* Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1993: *OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME.* May 5, Nov. 4

Table 3-23  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Soil  
Exposure Point: Area 3, Soil (0' to 10')  
Receptor Population: Routine worker  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)=  CS x IR x CF x FI x EF x ED x 1/BW x 1/AT
	IR	Ingestion Rate of Soil	mg/day	100	USEPA 1991, 97	50	USEPA 1991, 97	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1991	1,825	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) =  CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	SSAF	Soil to Skin Adherence Factor	mg/cm2-event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm2	5,800	USEPA 1992	5,000	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	250	USEPA 1993	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	9,125	USEPA, 1991	1,825	USEPA, 1991	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment ; Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5. Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-24  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future Medium: Soil Exposure Medium: Soil [Ambient Air (Vapors/particulates)] Exposure Point: Area 3, Soil (0' to 10') Receptor Population: Routine worker Receptor Age: Adult
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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	ET	Exposure Time	hr/8-hr workday	8/8	USEPA 1991, (1)	8/8	USEPA 1991, (1)	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

(1) Assume worker is in contact with soil for 8 hours of the 8-hour workday since there is no sediment evaluated in this area.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

Table 3-25  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Area 2, Soil (2' to 10')
Receptor Population: Routine worker
Receptor Age: Adult

File: TARA3\_13.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	87.5	USEPA 1991, 97	43.75	USEPA 1991, 97	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	--	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1991	1,825	USEPA 1991	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	SSAF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	5,800	USEPA 1992	5,000	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	9,125	USEPA, 1991	1,825	USEPA, 1991	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-26  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil [Ambient Air (Vapors/particulates)]
Exposure Point: Area 2, Soil (2' to 10')
Receptor Population: Routine worker
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	ET	Exposure Time	hr/8-hr workday	7/8	USEPA 1991, (1)	7/8	USEPA 1991, (1)	
	EF	Exposure Frequency	days/year	250	USEPA 1991	219	USEPA 1991	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

(1) Assume worker is in contact with soil for 7 hours of the 8-hour workday (see Section 3.4.8.1).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4



Table 3-27  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Area 1, Sediment
Receptor Population: Routine Worker
Receptor Age: Adult

File: tara3\_29 wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR	Ingestion Rate	mg/day	12.5	USEPA 1991	6.25	USEPA 1991	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	(1)	219	(2)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	9,125	(3)	1,825	(4)	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	(1)	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	5,800	USEPA 1992	5,000		
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	250	(1)	219	(2)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1993	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	9,125	(3)	1,825	(4)	

(1) Based on a five-day work week for 50 weeks per year.

(2) Based on an average for all full-time and part-time workers (USEPA, 1993).

(3) Assume 365 days per year for 25 years.

(4) Assume 365 days per year for 5 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA 1993: Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

Table 3-28  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Area 2, Sediment (Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1/AT$
	IR	Ingestion Rate	mg/day	12.5	USEPA 1991	6.25	USEPA 1991	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	(1)	219	(2)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	9,125	(3)	1,825	(4)	
Dermal	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	(1)	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	5,800	USEPA 1992	5,000		
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	250	(1)	219	(2)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1993	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	9,125	(3)	1,825	(4)	

(1) Based on a five-day work week for 50 weeks per year.

(2) Based on an average for all full-time and part-time workers (USEPA, 1993).

(3) Assume 365 days per year for 25 years.

(4) Assume 365 days per year for 5 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA 1993: Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

Table 3-29  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Area 4B, Sediment
Receptor Population: Routine Worker
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1 / AT$
	IR	Ingestion Rate	mg/day	100	USEPA 1991	50	USEPA 1991	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	(1)	219	(2)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	9,125	(3)	1,825	(4)	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1 / BW \times 1 / AT$
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	5,800	USEPA 1992	5,000		
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	250	(1)	219	(2)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1993	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

(1) Based on a 5-day work week for 50 weeks per year.

(2) Based on an average for all full-time and part-time workers (USEPA 1993).

(3) Assume 365 days per year for 25 years.

(4) Assume 365 days per year for 5 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1. Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA 1993: Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

Table 3-30  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 1, Surface Water (Fire Pond)  
Receptor Population: Routine Worker  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CW \times CR \times ET \times EF \times ED \times 1 / BW \times 1 / AT$
	CR	Contact Rate	L/hr	0.05	USEPA 1989	0.05	USEPA 1989	
	ET	Exposure Time	hr/day	1	(1)	1	(1)	
	EF	Exposure Frequency	days/year	12	(2)	3	(3)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,825	(4)	456	(4)	
Dermal	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1 / BW \times 1 / AT$
	ET	Exposure Time	hr/day	1	(1)	1	(1)	
	PC	Permeability Constant	cm/hr	chemical specific		chemical specific		
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	5,800	USEPA 1992	5,000	USEPA 1992	
	EF	Exposure Frequency	days/year	12	(2)	3	(3)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	CF	Conversion Factor	L/cm <sup>3</sup>	0.001	USEPA 1989	0.001	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,825	(4)	456	(4)	

(1) Assume that the worker will contact surface water for 1 hr/day.

(2) Assume once a week during the summer months.

(3) Assume once a month during the summer months.

(4) Assume to occur 3 months out of the year.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA 1993: Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

Table 3-31  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Area 2, Surface Water (Ditch)
Receptor Population: Routine Worker
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CW \times CR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CR	Contact Rate	L/hr	0.05	USEPA 1989	0.05	USEPA 1989	
	ET	Exposure Time	hr/day	1	(1)	1	(1)	
	EF	Exposure Frequency	days/year	12	(2)	3	(3)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,825	(4)	456	(4)	
Dermal	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1/BW \times 1/AT$
	ET	Exposure Time	hr/day	1	(1)	1	(1)	
	PC	Permeability Constant	cm/hr	chemical specific		chemical specific		
	SA	Skin Surface Area Available for Contact	cm2	5,800	USEPA 1992	5,000	USEPA 1992	
	EF	Exposure Frequency	days/year	12	(2)	3	(3)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	CF	Conversion Factor	L/cm3	0.001	USEPA 1989	0.001	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,825	(4)	456	(4)	

(1) Assume that the worker will contact surface water for 1 hr/day.

(2) Assume once a week during the summer months.

(3) Assume once a month during the summer months.

(4) Assume to occur 3 months out of the year.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA 1993: Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

Table 3-32  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water  
Receptor Population: Routine Worker  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CW \times CR \times ET \times EF \times ED \times 1 / BW \times 1 / AT$
	CR	Contact Rate	L/hr	0.05	USEPA 1989	0.05	USEPA 1989	
	ET	Exposure Time	hr/day	1	(1)	1	(1)	
	EF	Exposure Frequency	days/year	12	(2)	3	(3)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,825	(4)	456	(4)	
Dermal	CW	COPC Concentration in Surface Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1 / BW \times 1 / AT$
	ET	Exposure Time	hr/day	1	(1)	1	(1)	
	PC	Permeability Constant	cm/hr	chemical specific		chemical specific		
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	5,800	USEPA 1992	5,000	USEPA 1992	
	EF	Exposure Frequency	days/year	12	(2)	3	(3)	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	CF	Conversion Factor	L/cm <sup>3</sup>	0.001	USEPA 1989	0.001	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,825	(4)	456	(4)	

- (1) Assume that the worker will contact surface water for 1 hr/day.  
 (2) Assume once a week during the summer months.  
 (3) Assume once a month during the summer months.  
 (4) Assume to occur 3 months out of the year.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA 1993: Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

Table 3-33  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current  
Medium: Groundwater  
Exposure Medium: Lower Aquifer  
Exposure Point: Area 1, Groundwater (Tapwater)  
Receptor Population: Worker \*  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times IR \times EF \times ED \times 1/BW \times 1/AT$
	IR	Ingestion Rate	L-water/day	1.4	USEPA 1993	1	USEPA 1993	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	
Dermal Contact (bathing/shower)	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	0.001	USEPA 1989	0.001	USEPA 1989	
	SA	Skin Surface Area	cm2	23000	USEPA 1992	20000	USEPA 1992	
	Kp	Permeability	cm/hr	chem-spec		chem-spec		
	ET	Exposure Time	hr/day	0.33	USEPA 1992	0.17	USEPA 1992	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

\* Worker - Includes routine and utility maintenance workers.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-34  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Lower Aquifer  
Exposure Point: Area 1, 2, 3, 4B, Groundwater (Tapwater)  
Receptor Population: Worker \*  
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times IR \times EF \times ED \times 1/BW \times 1/AT$
	IR	Ingestion Rate	L-water/day	1.4	USEPA 1993	1	USEPA 1993	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	
Dermal Contact (bathing/shower)	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	0.001	USEPA 1989	0.001	USEPA 1989	
	SA	Skin Surface Area	cm2	23000	USEPA 1992	20000	USEPA 1992	
	Kp	Permeability	cm/hr	chem-spec		chem-spec		
	ET	Exposure Time	hr/day	0.33	USEPA 1992	0.17	USEPA 1992	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

\* Worker - Includes routine and utility maintenance workers.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.



Table 3-35  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current
Medium: Groundwater
Exposure Medium: Ambient Air (volatilization of VOCs from indoor water use)
Exposure Point: Area 1, Groundwater
Receptor Population: Worker *
Receptor Age: Adult

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CW	COPC Concentration in Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg - day)=
	IR	Inhalation Rate	m3/hr	2.5	USEPA 1991	2.5	USEPA 1991	$CW \times IR \times K \times FC \times ET \times EF \times ED \times 1/BW \times 1/AT$
	FC	Fraction Contaminated	unitless	1	USEPA 1989	1	USEPA 1989	
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	ET	Exposure Time	hr/day	0.33	USEPA 1997	0.17	USEPA 1997	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

\* Worker - Includes routine and utility maintenance workers.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

Table 3-36  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Ambient air (volatilization of VOCs from indoor water use)  
Exposure Point: Areas 1, 2, 3, 4B, Groundwater  
Receptor Population: Worker \*  
Receptor Age: Adult

file: TARA3\_55.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CW	COPC Concentration in Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg - day)= $CW \times IR \times K \times FC \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/hr	2.5	USEPA 1991	2.5	USEPA 1991	
	FC	Fraction Contaminated	unitless	1	USEPA 1989	1	USEPA 1989	
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	ET	Exposure Time	hr/day	0.33	USEPA 1997	0.17	USEPA 1997	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

\* Worker - Includes routine and utility maintenance worker.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

Table 3-37  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Areas 1, 2, and 3, Soil
Receptor Population: Utility Worker
Receptor Age: Adult

File: TARA3\_14.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	115.2	USEPA 1991, 93, (1)	51.14	USEPA 1991, 93, (2)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	- -	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1991	25	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	5,800	USEPA 1989	5,000	USEPA 1989	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1991	chemical-specific	USEPA 1991	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	9,125	USEPA, 1991	1,825	USEPA, 1991	

Sources:

(1) Assume Prorated Ingestion Rate of 100 mg/day for 240 days/year + 480 mg/day for 10 days/year

(2) Assume Prorated Ingestion Rate of 50 mg/day for 214 days/year + 100 mg/day for 5 days/year

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-38  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Soil  
Exposure Medium: Soil [Ambient Air (Vapors/Particulates)]  
Exposure Point: Areas 1, 2, and 3, Soil  
Receptor Population: Utility Worker  
Receptor Age: Adult

ile: TARA3\_27.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	ET	Exposure Time	hr/8-hr workday	8/8	USEPA 1989, (1)	8/8	USEPA 1989, (1)	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

(1) Assume a utility worker is in contact with soil for 8 hours of 8-hour workday in Areas 1, 2, and 3.

Table 3-39  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Area 4B, Sediment (Creek)
Receptor Population: Utility Worker
Receptor Age: Adult

File: tara3\_29.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1 / AT$
	IR	Ingestion Rate	mg/day	115.2	USEPA 1991, 93, (1)	51.14	USEPA 1991, 93, (2)	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1 / BW \times 1 / AT$
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	5,800	USEPA 1992	5,000	USEPA 1989	
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1993	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1993	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

Sources:

(1) Assume Prorated Ingestion Rate of 100 mg/day for 240 days/year + 480 mg/day for 10 days/year

(2) Assume Prorated Ingestion Rate of 50 mg/day for 214 days/year + 100 mg/day for 5 days/year

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B

Table 3-40  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Groundwater  
Exposure Medium: Groundwater  
Exposure Point: Areas 1 and 4B, Groundwater  
Receptor Population: Utility Worker  
Receptor Age: Adult

ile: TARA3\_51.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal Contact	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	1E-003	USEPA 1989	1E-03	USEPA 1989	
	SA	Skin Surface Area	cm2	5,800	USEPA 1992	5,000	USEPA 1992	
	Kp	Permeability	cm/hr	chem-spec		chem-spec		
	ET	Exposure Time	hr/day	8	(1)	8	(1)	
	EF	Exposure Frequency	days/year	10	(ENVIRON, 1998)	5	(ENVIRON, 1998)	
	ED	Exposure Duration	years	25	USEPA 1991	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	
Inhalation	CW	COPC Concentration in Water	mg/L	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times IR \times FC \times K \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	ET	Exposure Time	hr/hr in a day	8/8	(1)	8/8	(1)	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	10	(ENVIRON, 1998)	5	(ENVIRON, 1998)	
	ED	Exposure Duration	years	25	USEPA 1991	5	USEPA 1993	
	BW	Body Weight	kg	70	USEPA 1997	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

(1) Assume workday of 8 hrs.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

ENVIRON, 1998: Revised Baseline Risk Assessment, American Chemical Service NPL Site, September 1998.

Table 3-41  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Soil  
Exposure Point: Areas 1, 2, and 3, Soil  
Receptor Population: Construction worker  
Receptor Age: Adult

File: TARA3\_15.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables			Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	480	USEPA 1991, 93			
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989			
	FI	Fraction Ingested	- -	1	USEPA 1989			
	EF	Exposure Frequency	days/year	196	(1)			
	ED	Exposure Duration	years	1	(1)			
	BW	Body Weight	kg	70	USEPA 1989			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991			
	AT-N	Averaging Time (Non-cancer)	days	274	USEPA 1991			
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables			CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992			
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	5,800	USEPA 1992			
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1998a, b			
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b			
	EF	Exposure Frequency	days/year	196	(1)			
	ED	Exposure Duration	years	1	(1)			
	BW	Body Weight	kg	70	USEPA 1989			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991			
	ATn	Averaging Time (Non-cancer)	days	274	USEPA, 1991			

Sources:

(1) Assume 5 days/week for nine months

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-42  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Soil [Ambient Air (volatilization of VOCs)]  
Exposure Point: Area 1, 2, and 3, Soil  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: TARA3\_28.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables			Chronic Daily Intake (CDI) (mg/kg-day) = $CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	30	USEPA 1991 (1)			
	ET	Exposure Time	hr/hr in day	8/8	(2)			
	EF	Exposure Frequency	days/year	196	(3)			
	ED	Exposure Duration	years	1	(3)			
	BW	Body Weight	kg	70	USEPA 1997			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991			
	AT-N	Averaging Time (Non-cancer)	days	274	USEPA 1991			

(1) Due to intensive activity, assume the RME inhalation rate for an adult.

(2) Assume 8 hour work day

(3) Assume 5 days/week for nine months

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15



Table 3-43  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Areas 4B, Sediment  
Receptor Population: Construction worker  
Receptor Age: Adult

File: TARA3\_15.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables			Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Sediment	mg/day	480	USEPA 1991, 93			
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989			
	FI	Fraction Ingested	--	1	USEPA 1989			
	EF	Exposure Frequency	days/year	196	(1)			
	ED	Exposure Duration	years	1	(1)			
	BW	Body Weight	kg	70	USEPA 1989			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991			
	AT-N	Averaging Time (Non-cancer)	days	274	USEPA 1991			
Dermal	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables			CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm2-event	1	USEPA 1992			
	SA	Skin Surface Area Available for Contact	cm2	5,800	USEPA 1992			
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1998a, b			
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b			
	EF	Exposure Frequency	days/year	196	(1)			
	ED	Exposure Duration	years	1	(1)			
	BW	Body Weight	kg	70	USEPA 1989			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991			
	ATn	Averaging Time (Non-cancer)	days	274	USEPA, 1991			

Sources:

(1) Assume 5 days/week for nine months

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-44  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Upper Aquifer  
Exposure Point: Area 1, 4B, and 5B, Groundwater  
Receptor Population: Construction Worker  
Receptor Age: Adult

file: TARA3\_51.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal Contact	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables			Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	1E-003	USEPA 1989			
	SA	Skin Surface Area	cm2	5,800	USEPA 1992			
	Kp	Permeability	cm/hr	chem-spec				
	ET	Exposure Time	hr/day	8	(1)			
	EF	Exposure Frequency	days/year	196	(2)			
	ED	Exposure Duration	years	1	(2)			
	BW	Body Weight	kg	70	USEPA 1989			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991			
	AT-N	Averaging Time (Non-cancer)	days	274	USEPA 1991			
Inhalation	CW	COPC Concentration in Water	mg/L	See Risk Tables	See Risk Tables			Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times IR \times ET \times K \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	30	USEPA 1991 (3)			
	K	Volatilization Factor	L/m3	0.5	USEPA 1991			
	ET	Exposure Time	hr/hr in a work day	8/8	(1)			
	EF	Exposure Frequency	days/year	196	(4)			
	ED	Exposure Duration	years	1	(4)			
	BW	Body Weight	kg	70	USEPA 1997			
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989			
	AT-N	Averaging Time (Non-cancer)	days	274	USEPA 1989			

Sources:

(1) Assume workday of 8 hrs.

(2) Assume 5 days/week for 9 months

(3) Due to intensive activity, assume the RME inhalation rate for an adult.

(4) 5 days/week for 9 months

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

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USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-45  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Lower Aquifer  
Exposure Point: Area 5B, Groundwater (Car Wash)  
Receptor Population: Commercial Worker  
Receptor Age: Adult

ile: TARA3\_58.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal Contact (carwash)	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)=
	CF	Conversion Factor	L/cm2	0.001	USEPA 1989	0.001	USEPA 1989	$CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	SA	Skin Surface Area	cm2	23000	USEPA 1992	20000	USEPA 1992	
	Kp	Permeability	cm/hr	chem-spec		chem-spec		
	ET	Exposure Time	hr/day	8	USEPA 1992	8	USEPA 1992	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	9,125	USEPA 1989	1,825	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-46  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Lower Aquifer (Ambient air (volatilization of VOCs from indoor water use))  
Exposure Point: Area 5B, Groundwater (Car Wash)  
Receptor Population: Commercial Worker  
Receptor Age: Adult

ile: TARA3\_59.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation (carwash)	CA	COPC Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg - day)=
	IR	Inhalation Rate	m3/day	20	USEPA 1989	20	USEPA 1989	$CA \times IR \times K \times FC \times ET \times EF \times ED \times 1/BW \times 1/AT$
	FC	Fraction Contaminated	unitless	1	USEPA 1989	1	USEPA 1989	
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	ET	Exposure Time	hr/hr in work day	8/8	USEPA 1997	8/8	USEPA 1997	
	EF	Exposure Frequency	days/year	250	USEPA 1989	219	USEPA 1989	
	ED	Exposure Duration	years	25	USEPA 1989	5	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	7,300	USEPA 1989	1,825	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

Table 3-47  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Soil
Exposure Point: Area 5A, Surface Soil (0' to 2')
Receptor Population: Offsite Resident
Receptor Age: Adult

File: TARA3\_12.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	COPC Contaminant in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	IR-S	Ingestion Rate of Soil	mg/day	100	USEPA 1991, 97	50	USEPA 1991, 97	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested	--	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	24	USEPA 1989, 91	9	USEPA 1989, 91	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	10,950	USEPA 1991	3,285	USEPA 1991	
Dermal	CS	COPC Contaminant in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SSAF	Soil to Skin Adherence Factor	mg/cm2-event	1	USEPA 1992	0.2	USEPA 1992	
	SA	Skin Surface Area Available for Contact	cm2	5,800	USEPA 1992	5,000	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	24	USEPA 1989, 91	9	USEPA 1989, 91	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	10,950	USEPA, 1991	3,285	USEPA, 1991	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1997: Exposure Factors Handbook. August

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-48  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Soil  
Exposure Medium: Soil [Ambient Air (Vapors/particulates)]  
Exposure Point: Area 5A, Soil  
Receptor Population: Offsite Resident  
Receptor Age: Adult

File: tara3\_19.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	
	ET	Exposure Time	hr/hr in day	24/24	USEPA 1991	18/24	USEPA 1991	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	24	USEPA 1989	9	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	8,760	USEPA 1989	3,285	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

**Table 3-49**  
**Values Used For Daily Intake Calculations**  
**American Chemical Service NPL Site**

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Lower Aquifer
Exposure Point: Area 5A, Groundwater (Private Well)
Receptor Population: Offsite Resident
Receptor Age: Adult

ile: TARA3\_52.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)=  CW x IR x EF x ED x 1/BW x 1/AT
	IR	Ingestion Rate	L-water/day	2	USEPA 1989	1.4	USEPA 1989	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	350	USEPA 1989	350	USEPA 1989	
	ED	Exposure Duration	years	24	USEPA 1989	9	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	8,760	USEPA 1989	3,285	USEPA 1989	
Dermal Contact (bathing/shower)	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)=  CW x CF x VF x SA x Kp x ET x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	L/cm2	1E-003	USEPA 1989	1E-003	USEPA 1989	
	SA	Skin Surface Area	cm2	23,000	USEPA 1997	20,000	USEPA 1997	
	Kp	Permeability	cm/hr	chem-spec	USEPA 1992	chem-spec	USEPA 1992	
	ET	Exposure Time	hr/day	0.58	USEPA 1997	0.17	USEPA 1997	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	24	USEPA 1989	9	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	8,760	USEPA 1989	3,285	USEPA 1989	

**Sources:**

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1997: Exposure Factors Handbook. August

Table 3-50  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Groundwater  
Exposure Medium: Ambient Air (volatilization of VOCs)  
Exposure Point: Area 5A, Groundwater (Private Wells)  
Receptor Population: Offsite Resident  
Receptor Age: Adult

ile: TARA3\_55.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	COPC Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg - day)= $CA \times IR \times K \times FC \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/hr	0.83	USEPA 1989	0.83	USEPA 1989	
	ET	Exposure Time	hr/day	0.58	USEPA 1989	0.17	USEPA 1989	
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	FC	Fraction Contaminated	unitless	1	USEPA 1997	1	USEPA 1997	
	EF	Exposure Frequency	days/year	350	USEPA 1989	350	USEPA 1989	
	ED	Exposure Duration	years	24	USEPA 1989	9	USEPA 1989	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	8,760	USEPA 1989	3,285	USEPA 1989	

**Sources:**

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.



Table 3-51  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Groundwater  
Exposure Medium: Groundwater, Upper Aquifer  
Exposure Point: Area 5A, Groundwater (Outdoor Use)  
Receptor Population: Offsite Resident  
Receptor Age: Adult

ile: TARA3\_47.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) mg/kg-day= $CW \times IR \times EF \times ED \times 1/BW \times 1/AT$
	IR	Ingestion Rate	L-water/day	0.05	USEPA 1989, 97	0.05	USEPA 1989, 97	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	40	USEPA 1997	40	USEPA 1997	
	ED	Exposure Duration	years	24	USEPA 1989, 91	9	USEPA 1989, 91	
	BW	Body Weight	kg	70	USEPA 1997	70	USEPA 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	4,563	USEPA 1989	1,369	USEPA 1989	
Dermal	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) mg/kg-day= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	1E-03	USEPA 1989	1E-03	USEPA 1989	
	SA	Skin Surface Area	cm2	5,800	USEPA 1997	5,000	USEPA 1997	
	Kp	Permeability	cm/hr	Chem-Specific		Chem-Specific		
	ET	Exposure Time	hr/day	1	USEPA 1997	1	USEPA 1997	
	EF	Exposure Frequency	days/year	40	USEPA 1997	40	USEPA 1997	
	ED	Exposure Duration	years	24	USEPA 1989, 91	24	USEPA 1989, 91	
	BW	Body Weight	kg	70	USEPA 1997	70	USEPA 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	4,563	USEPA 1989	1,369	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1997: Exposure Factors Handbook. August

Table 3-52  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Area 6, Sediment (Creek)
Receptor Population: Offsite Resident
Receptor Age: Adult

File: tara3\_36.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1 / AT$
	IR	Ingestion Rate	mg/day	100	USEPA 1991	50	USEPA 1991	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	6	(1)	2	(2)	
	ED	Exposure Duration	years	30	(3)	9	(4)	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
Dermal	ATn	Averaging Time (Non-Cancer)	days	180	(5)	18	(6)	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1 / BW \times 1 / AT$
	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	5,800	USEPA 1992	5,000	USEPA 1992	
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	6	(1)	2	(2)	
	ED	Exposure Duration	years	30	(3)	9	(4)	
	BW	Body Weight	kg	70	USEPA 1989	70	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	180	(5)	18	(6)	

(1) Assume one day per month in the spring (3 months), and one day per month in the fall (3 months).

(2) Assume one day in the spring and one day in the fall.

(3) Based on the 90 percentile for individuals living at one residence (USEPA 1991).

(4) Based on the median number of years that individuals live at one residence (USEPA 1991).

(5) Assume six days per year for 30 years.

(6) Assume two days per year for 9 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment : Principles and Applications. Interim Report. EPA/600/8-91/011B.

Table 3-53  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Soil  
Exposure Medium: Soil  
Exposure Point: Area 5A, Soil  
Receptor Population: Offsite Resident  
Receptor Age: Child

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	unitless	1.00E-006	USEPA 1991, 97	1.00E-006	USEPA 1991, 97	
	IR-S	Ingestion Rate of Soil	mg/day	200	USEPA 1989	100	USEPA 1989	
	FI	Fraction Ingested	--	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	6	USEPA 1989, 91	6	USEPA 1989, 91	
	BW	Body Weight	kg	15	USEPA 1989	15	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	AT-N	Averaging Time (Non-cancer)	days	2,190	USEPA 1991	2,190	USEPA 1991	
Dermal	CS	COPC Concentration in Soil	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup>	2,100	USEPA 1998a, b	1,800	USEPA 1998a, b	
	SSAF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	1	USEPA 1992	0.2	USEPA 1992	
	CF	Conversion Factor	kg/mg	1.00E-006	USEPA 1989	1.00E-006	USEPA 1989	
	DABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA 1998b	chemical-specific	USEPA 1998b	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	6	USEPA 1989, 91	6	USEPA 1989, 91	
	BW	Body Weight	kg	15	USEPA 1989	15	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-cancer)	days	2,190	USEPA, 1991	2,190	USEPA, 1991	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1993: OSWER Preliminary Review Draft, Superfund's Standard Default Exposure Factors for CT and RME. May 5, Nov. 4

USEPA, 1998a: Integrated Risk Information System (IRIS) on-line database. June.

USEPA, 1998b: Region IX Preliminary Remediation Goals, May 1.

Table 3-54  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Soil  
Exposure Medium: Ambient Air (Vapors/particulates)  
Exposure Point: Area 5A, Soil  
Receptor Population: Offsite Resident  
Receptor Age: Child

File: tara3\_19.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Inhalation Rate	m3/day	20	USEPA 1991	20	USEPA 1991	CA x IR x ET x EF x ED x 1/BW x 1/AT
	ET	Exposure Time	hr/hr in day	24/24	USEPA 1991	18/24	USEPA 1991	
	EF	Exposure Frequency	days/year	350	USEPA 1991	350	USEPA 1991	
	ED	Exposure Duration	years	6	USEPA 1989	6	USEPA 1989	
	BW	Body Weight	kg	15	USEPA 1991	15	USEPA 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	2,190	USEPA 1989	2,190	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

Table 3-55  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Groundwater  
Exposure Medium: Lower Aquifer  
Exposure Point: Area 5A, Groundwater (Private Wells)  
Receptor Population: Offsite Resident  
Receptor Age: Child

ile: TARA3\_52.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times IR \times EF \times ED \times 1/BW \times 1/AT$
	IR	Ingestion Rate	L-water/day	1	USEPA 1989	0.5	USEPA 1989	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	500	USEPA 1997	250	USEPA 1997	
	ED	Exposure Duration	years	6	USEPA 1989	6	USEPA 1989	
	BW	Body Weight	kg	15	USEPA 1989	15	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	2,190	USEPA 1989	2,190	USEPA 1989	
Dermal Contact (bathing/shower)	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day)= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	1E-003	USEPA 1989	1E-003	USEPA 1989	
	SA	Skin Surface Area	cm2	8,400	USEPA 1997	7,200	USEPA 1997	
	Kp	Permeability	cm/hr	chem-spec	USEPA 1992	chem-spec	USEPA 1992	
	ET	Exposure Time	hr/day	0.75	USEPA 1997	0.33	USEPA 1997	
	EF	Exposure Frequency	days/year	500	USEPA 1997	250	USEPA 1997	
	ED	Exposure Duration	years	6	USEPA 1989	6	USEPA 1989	
	BW	Body Weight	kg	15	USEPA 1989	15	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	2,190	USEPA 1989	2,190	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1997: Exposure Factors Handbook. August

Table 3-56  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Ambient air (volatilization of VOCs from indoor water use)
Exposure Point: Area 5A, Groundwater (Private-Household)
Receptor Population: Offsite Resident
Receptor Age: Child

ile: TARA3\_55.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	COPC Concentration in Air	mg/m3	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg - day)= $CA \times IR \times FC \times K \times ET \times EF \times ED \times 1/BW \times 1/AT$
	IR	Inhalation Rate	m3/hr	0.83	USEPA 1989	0.83	USEPA 1989	
	FC	Fraction Contaminated	unitless	1	USEPA 1989	1	USEPA 1989	
	K	Volatilization Factor	L/m3	0.5	USEPA 1991	0.5	USEPA 1991	
	ET	Exposure Time	hr/day	0.75	USEPA 1997	0.33	USEPA 1997	
	EF	Exposure Frequency	days/year	350	USEPA 1989	350	USEPA 1989	
	ED	Exposure Duration	years	6	USEPA 1989	6	USEPA 1989	
	BW	Body Weight	kg	15	USEPA 1989	15	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	2,190	USEPA 1989	2,190	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

xposure Factors Handbook. August

Table 3-57  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Groundwater  
Exposure Medium: Upper Aquifer, Outdoor Use  
Exposure Point: Area 5A, Groundwater (Outdoor Use)  
Receptor Population: Offsite Resident  
Receptor Age: Child

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Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) mg/kg-day= $CW \times IR \times EF \times ED \times 1/BW \times 1/AT$
	IR	Ingestion Rate	L-water/day	0.15	USEPA 1989, 97	0.05	USEPA 1989, 97	
	FC	Fraction Contaminated	Unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	36	USEPA 1997	9	USEPA 1997	
	ED	Exposure Duration	years	6	USEPA 1989, 91	6	USEPA 1989, 91	
	BW	Body Weight	kg	15	USEPA 1997	15	USEPA 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	548	USEPA 1989	548	USEPA 1989	
Dermal	CW	COPC Concentration in Water	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) mg/kg-day= $CW \times CF \times SA \times Kp \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	L/cm2	1E-03	USEPA 1989	1E-03	USEPA 1989	
	SA	Skin Surface Area	cm2	8,400	USEPA 1997	7,200	USEPA 1989	
	Kp	Permeability	cm/hr	chem-specific	USEPA 1992	chem-specific	USEPA 1992	
	ET	Exposure Time	hr/day	3	USEPA 1997	1	USEPA 1997	
	EF	Exposure Frequency	days/year	36	USEPA 1997	9	USEPA 1997	
	ED	Exposure Duration	years	6	USEPA 1989, 91	6	USEPA 1989, 91	
	BW	Body Weight	kg	15	USEPA 1997	15	USEPA 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-cancer)	days	548	USEPA 1989	548	USEPA 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA, 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

USEPA, 1997: Exposure Factors Handbook. August

Table 3-58  
Values Used For Daily Intake Calculations  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Area 6, Sediment  
Receptor Population: Offsite Resident  
Receptor Age: Child

File: tara3\_36.wk4

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	Chronic Daily Intake (CDI) (mg/kg-day) = $CS \times IR \times CF \times FI \times EF \times ED \times 1 / BW \times 1/AT$
	IR	Ingestion Rate	mg/day	200	USEPA 1991	100	USEPA 1991	
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	FI	Fraction Ingested From Contaminated Source	unitless	1	USEPA 1989	1	USEPA 1989	
	EF	Exposure Frequency	days/year	78	(1)	52	(2)	
	ED	Exposure Duration	years	6	(3)	6	(3)	
	BW	Body Weight	kg	15	USEPA 1989	15	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,643	(4)	548	(5)	
Dermal	CS	COPC Concentration in Sediment	mg/kg	See Risk Tables	See Risk Tables	See Risk Tables	See Risk Tables	CDI (mg/kg-day) = $CS \times CF \times SA \times AF \times ABS \times EF \times ED \times 1/BW \times 1/AT$
	CF	Conversion Factor	kg/mg	1E-006	USEPA 1989	1E-006	USEPA 1989	
	SA	Skin Surface Area Available for Contact	cm <sup>2</sup> /event	2,100	USEPA 1992	1,800	USEPA 1992	
	AF	Soil to Skin Adherence Factor	mg/cm <sup>2</sup> -event	0.3	USEPA 1992	0.3	USEPA 1992	
	ABS	Absorption Factor	unitless	Chemical Specific		Chemical Specific		
	EF	Exposure Frequency	days/year	78	(1)	52	(2)	
	ED	Exposure Duration	years	6	(3)	6	(4)	
	BW	Body Weight	kg	50	USEPA 1989	50	USEPA 1989	
	ATc	Averaging Time (Cancer)	days	25,550	USEPA 1991	25,550	USEPA 1991	
	ATn	Averaging Time (Non-Cancer)	days	1,643	(5)	548	(6)	

(1) Assume four days per week in the summer (3 months), one day per week in the spring (3 months), and one day per week in the fall (3 months).

(2) Assume four days per week during the summer months only.

(3) Assume 6 years based on the total years in the 1-6 year old age group.

(4) Assume to occur 9 months out of the year for 6 years.

(6) Assume to occur 3 months out of the year for 6 years.

Sources:

USEPA 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA 1991: Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03, March 15.

USEPA 1992: Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.



Table 4-1  
Adult Non-cancer Toxicity Data -- Oral/Dermal  
ACS NPL Site -- Griffith, Indiana

FILE: c:\projects\acsnpl\site\TARATOX.WK4

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (%) (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ or System	Combined Uncertainty/ Modifying Factors	Sources of RfD/ Target Organ*	Dates of RfD: (3) Target Organ (MM/DD/YY)
ortho-xylene	Chronic	2	mg/kg-day	90	1.8	mg/kg-day	fetotoxic		H	10/01/98
Pentachlorophenol	Chronic	0.03	mg/kg-day		0.03	mg/kg-day	liver		I	10/01/98
Phenanthrene	Chronic		mg/kg-day			mg/kg-day	NA			
Phenol	Chronic	0.6	mg/kg-day		0.6	mg/kg-day	liver		I	10/01/98
Pyrene	Chronic	0.03	mg/kg-day		0.03	mg/kg-day	liver		I	10/01/98
Selenium	Chronic	0.005	mg/kg-day		0.005	mg/kg-day	liver		I	10/01/98
Silver	Chronic	0.005	mg/kg-day	21	0.00105	mg/kg-day	skin		I	10/01/98
Styrene	Chronic	0.2	mg/kg-day		0.2	mg/kg-day	liver		I	10/01/98
Tetrachloroethene	Chronic	0.01	mg/kg-day	100	0.01	mg/kg-day	liver		I	10/01/98
Thallium	Chronic	0.00007	mg/kg-day		0.00007	mg/kg-day	NA		O	10/01/98
Toluene	Chronic	0.2	mg/kg-day	100	0.2	mg/kg-day	liver		I	10/01/98
trans-1,2-Dichloroethene	Chronic	0.02	mg/kg-day	100	0.02	mg/kg-day	kidney		I	10/01/98
Trichloroethene	Chronic	0.006	mg/kg-day	98	0.00588	mg/kg-day	liver		E	10/01/98
Vanadium	Chronic	0.007	mg/kg-day		0.007	mg/kg-day	circulatory system		H	10/01/98
Vinyl Chloride	Chronic		mg/kg-day	100		mg/kg-day	liver		H	10/01/98
Xylene (mixed)	Chronic	2	mg/kg-day	89.5	1.79	mg/kg-day	fetotoxic		I	10/01/98
Zinc	Chronic	0.3	mg/kg-day	30	0.09	mg/kg-day	thyroid		I	10/01/98

NA = Not Applicable

\* E = EPA - ECAO

(1) Refer to RAGS, Part A

H = Health Effects Assessment Summary Tables (HEAST)

(2) Adjusted Dermal RfD = Oral RfD \* (Adjustment Factor), default  
value of 100% was used when Adjustment Factor was not available.

I = Integrated Risk Information System (IRIS)

O = Other

(3) Date of most recent search of IRIS or most recent EPA-ECAO provisional value.

TABLE 4-3  
ADULT NON-CANCER TOXICITY DATA -- INHALATION  
ACS Site -- Griffith, IA

FILE: c:\project\acs\skibis\TARATOX.WK4

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RIC	Units	Adjusted Inhalation RID (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RIC/RID/ Target Organ*	Dates (2) (MM/DD/YY)
1,1,1-Trichloroethane	Chronic	1.0E+000	mg/m3	2.9E-001	mg/kg-day	liver		E	10/01/98
1,1,2,2-Tetrachloroethane	Chronic		mg/m3		mg/kg-day	liver			
1,1,2-Trichloroethane	Chronic		mg/m3		mg/kg-day	liver			
1,1-Dichloroethane	Chronic	4.9E-001	mg/m3	1.4E-001	mg/kg-day	kidney		A	10/01/98
1,2,4-Trichlorobenzene	Chronic	2.0E-001	mg/m3	5.7E-002	mg/kg-day	liver		H	10/01/98
1,2,4-Trimethylbenzene	Chronic	6.0E-003	mg/m3	1.7E-003	mg/kg-day	respiratory system		E	10/01/98
1,2-Dichlorobenzene	Chronic	3.2E-002	mg/m3	9.0E-003	mg/kg-day	low body weight		E	10/01/98
1,2-Dichloroethane	Chronic	4.9E-003	mg/m3	1.4E-003	mg/kg-day	circulatory system		E	10/01/98
1,2-Dichloroethene(mixture)	Chronic		mg/m3		mg/kg-day				
1,2-Dichloropropane	Chronic	4.0E-003	mg/m3	1.1E-003	mg/kg-day			I	10/01/98
1,3,5-Trimethylbenzene	Chronic	6.0E-003	mg/m3	1.7E-003	mg/kg-day	respiratory system		E	10/01/98
1,3-Dichlorobenzene	Chronic	7.0E-003	mg/m3	2.0E-003	mg/kg-day	respiratory system		E	10/01/98
1,4-Dichlorobenzene	Chronic	8.0E-001	mg/m3	2.3E-001	mg/kg-day	liver		I	10/01/98
2,2'-oxybis(1-Chloropropane)	Chronic		mg/m3		mg/kg-day	liver			
2,4,5-Trichlorophenol	Chronic		mg/m3		mg/kg-day				
2,4-Dichlorophenol	Chronic		mg/m3		mg/kg-day				
2,4-Dimethylphenol	Chronic		mg/m3		mg/kg-day			I	10/01/98
2,4-Dinitrotoluene	Chronic		mg/m3		mg/kg-day				
2,6-Dinitrotoluene	Chronic		mg/m3		mg/kg-day	NA			
2-Butanone (MEK)	Chronic	1.0E+000	mg/m3	2.9E-001	mg/kg-day	CNS		I	10/01/98
2-Hexanone	Chronic	4.9E-003	mg/m3	1.4E-003	mg/kg-day	CNS		E	10/01/98
2-Methylnaphthalene	Chronic		mg/m3		mg/kg-day				
2-Methylphenol (O-Cresol)	Chronic		mg/m3		mg/kg-day				
3,3-Dichlorobenzidine	Chronic		mg/m3		mg/kg-day				
4,4'-DDD	Chronic		mg/m3		mg/kg-day				
4,4'-DDE	Chronic		mg/m3		mg/kg-day				
4,4'-DDT	Chronic		mg/m3		mg/kg-day	liver			
4-Methyl-2-Pentanone	Chronic	7.0E-002	mg/m3	2.0E-002	mg/kg-day	CNS		A	10/01/98
4-Methylphenol (P-Cresol)	Chronic		mg/m3		mg/kg-day				
4-Nitrophenol	Chronic		mg/m3		mg/kg-day				
Acenaphthene	Chronic		mg/m3		mg/kg-day				
Acetone	Chronic		mg/m3		mg/kg-day				
Aldrin	Chronic		mg/m3		mg/kg-day				
Alpha-BHC	Chronic		mg/m3		mg/kg-day				
Alpha-Chlordane	Chronic	7.0E-004	mg/m3	2.0E-004	mg/kg-day	liver			
Aluminum	Chronic	3.5E-003	mg/m3	1.0E-003	mg/kg-day	respiratory system		E	10/01/98
Ammonia	Chronic	1.0E-001	mg/m3	2.9E-002	mg/kg-day	respiratory system		I	10/01/98
Anthracene	Chronic		mg/m3		mg/kg-day				
Antimony	Chronic		mg/m3		mg/kg-day				
Arochlor-1242	Chronic		mg/m3		mg/kg-day				
Arochlor-1248	Chronic		mg/m3		mg/kg-day				
Arochlor-1254	Chronic		mg/m3		mg/kg-day				
Arochlor-1260	Chronic		mg/m3		mg/kg-day				
Arsenic	Chronic		mg/m3		mg/kg-day	respiratory tract			
Barium	Chronic	4.9E-004	mg/m3	1.4E-004	mg/kg-day	fetotoxic		A	10/01/98
Benzene	Chronic	6.0E-003	mg/m3	1.7E-003	mg/kg-day	hematotoxicity		E	10/01/98
Benzo(a)Anthracene	Chronic		mg/m3		mg/kg-day				
Benzo(a)Pyrene	Chronic		mg/m3		mg/kg-day				
Benzo(b)Fluoranthene	Chronic		mg/m3		mg/kg-day				
Benzo(k)Fluoranthene	Chronic		mg/m3		mg/kg-day				
Benzoic Acid	Chronic		mg/m3		mg/kg-day				
Benzyl Alcohol	Chronic		mg/m3		mg/kg-day				
Beryllium	Chronic	2.0E-005	mg/m3	5.7E-006	mg/kg-day	lung		I	10/01/98
Beta-BHC	Chronic		mg/m3		mg/kg-day				
bis(2-Chloroethyl)Ether	Chronic		mg/m3		mg/kg-day	liver			

TABLE 4-3  
ADULT NON-CANCER TOXICITY DATA -- INHALATION  
ACS Site -- Griffith, IA

FILE c:\project\acs\sketch\TARATOX.WK4

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RIC	Units	Adjusted Inhalation RID (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RIC:RID/ Target Organ*	Dates (2) (MM/DD/YY)
bis(2-Ethylhexyl)Phthalate	Chronic		mg/m3		mg/kg-day				
Bromodichloromethane	Chronic		mg/m3		mg/kg-day	NA			
Butyl Benzyl Phthalate	Chronic		mg/m3		mg/kg-day				
Cadmium (food)	Chronic		mg/m3		mg/kg-day				
Cadmium (water)	Chronic		mg/m3		mg/kg-day	respiratory tract			
Carbazole	Chronic		mg/m3		mg/kg-day				
Carbon Disulfide	Chronic	7.0E-001	mg/m3	2.0E-001	mg/kg-day			I	10/01/98
Chlorobenzene	Chronic	1.8E-002	mg/m3	5.0E-003	mg/kg-day	liver		A	10/01/98
Chloroethane	Chronic	1.0E+001	mg/m3	2.9E+000	mg/kg-day	fetotoxic		I	10/01/98
Chloroform	Chronic	3.0E-004	mg/m3	8.6E-005	mg/kg-day	liver		E	10/01/98
Chloromethane	Chronic		mg/m3		mg/kg-day	kidney			
Chromium (III)	Chronic		mg/m3		mg/kg-day				
Chromium (VI)	Chronic		mg/m3		mg/kg-day	respiratory tract			
Chrysene	Chronic		mg/m3		mg/kg-day				
cis-1,2-Dichloroethene	Chronic		mg/m3		mg/kg-day				
Cobalt	Chronic		mg/m3		mg/kg-day				
Copper	Chronic		mg/m3		mg/kg-day				
Cyanide	Chronic		mg/m3		mg/kg-day				
Di-n-Butylphthalate	Chronic		mg/m3		mg/kg-day				
Di-n-Octyl Phthalate	Chronic		mg/m3		mg/kg-day				
Dibenzo(a,h)Anthracene	Chronic		mg/m3		mg/kg-day				
Dibenzofuran	Chronic		mg/m3		mg/kg-day				
Dieldrin	Chronic		mg/m3		mg/kg-day				
Diethylphthalate	Chronic		mg/m3		mg/kg-day				
Dimethylphthalate	Chronic		mg/m3		mg/kg-day				
Endosulfan	Chronic		mg/m3		mg/kg-day				
Endrin	Chronic		mg/m3		mg/kg-day				
Ethylbenzene	Chronic	1.0E+000	mg/m3	2.9E-001	mg/kg-day	respiratory tract		I	10/01/98
Fluoranthene	Chronic		mg/m3		mg/kg-day				
Fluorene	Chronic		mg/m3		mg/kg-day				
Gamma-BHC	Chronic		mg/m3		mg/kg-day				
Gamma-Chlordane	Chronic	7.0E-004	mg/m3	2.0E-004	mg/kg-day			I	10/01/98
Heptachlor	Chronic		mg/m3		mg/kg-day				
Heptachlor epoxide	Chronic		mg/m3		mg/kg-day			I	10/01/98
Hexachlorobenzene	Chronic		mg/m3		mg/kg-day	liver			
Hexachlorobutadiene	Chronic		mg/m3		mg/kg-day	kidney			
Indeno(1,2,3-cd)Pyrene	Chronic		mg/m3		mg/kg-day			H	10/01/98
Iron	Chronic		mg/m3		mg/kg-day			I	10/01/98
Isophorone	Chronic		mg/m3		mg/kg-day				
Lead	Chronic		mg/m3		mg/kg-day				
m,p-xylene	Chronic		mg/m3		mg/kg-day				
Manganese (nonfood)	Chronic	5.0E-005	mg/m3	1.4E-005	mg/kg-day	respiratory tract		I	10/01/98
Mercury	Chronic	3.0E-004	mg/m3	8.6E-005	mg/kg-day	CNS		I	10/01/98
Methoxychlor	Chronic		mg/m3		mg/kg-day	reproductive system			
Methylene Chloride	Chronic	3.0E+000	mg/m3	8.6E-001	mg/kg-day	respiratory tract		H	10/01/98
Naphthalene	Chronic	3.2E-003	mg/m3	9.0E-004	mg/kg-day	circulatory system		E	10/01/98
Nickel	Chronic		mg/m3		mg/kg-day	respiratory tract			
Nitrate/Nitrite	Chronic		mg/m3		mg/kg-day				
N-Nitrosodiphenylamine	Chronic		mg/m3		mg/kg-day				
ortho-xylene	Chronic		mg/m3		mg/kg-day				
Pentachlorophenol	Chronic		mg/m3		mg/kg-day				
Phenanthrene	Chronic		mg/m3		mg/kg-day				
Phenol	Chronic		mg/m3		mg/kg-day				
Pyrene	Chronic		mg/m3		mg/kg-day				
Selenium	Chronic		mg/m3		mg/kg-day				
Silver	Chronic		mg/m3		mg/kg-day				

TABLE 4-3  
ADULT NON-CANCER TOXICITY DATA – INHALATION  
ACS Site – Griffith, IA

FILE: c:\projects\acsis\tables\TARATOX.WK4

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RIC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RIC:RfD/ Target Organ*	Dates (2) (MM/DD/YY)
Styrene	Chronic	1.0E+000	mg/m3	2.9E-001	mg/kg-day	CNS		I	10/01/98
Tetrachloroethene	Chronic	4.9E-001	mg/m3	1.4E-001	mg/kg-day	liver		E	10/01/98
Thallium	Chronic		mg/m3		mg/kg-day				
Toluene	Chronic	4.0E-001	mg/m3	1.1E-001	mg/kg-day	CNS		I	10/01/98
trans-1,2-Dichloroethene	Chronic		mg/m3		mg/kg-day				
Trichloroethene	Chronic		mg/m3		mg/kg-day	respiratory tract			
Vanadium	Chronic		mg/m3		mg/kg-day				
Vinyl Chloride	Chronic		mg/m3		mg/kg-day	CNS			
Xylene (mixed)	Chronic		mg/m3		mg/kg-day	CNS			
Zinc	Chronic		mg/m3		mg/kg-day				

NA = Not Applicable

(1) Adjusted Inhalation RfD = RIC \* (20m3/day / 70 kg)

(2) Date of most recent search of IRIS or most recent EPA-ECAO provisional value.

\* E = EPA - ECAO

H = Health Effects Assessment Summary Tables (HEAST)

A = HEAST Alternate

I = Integrated Risk Information System (IRIS)

TABLE 4-4  
Adult/Child CANCER TOXICITY DATA – INHALATION  
ACS Site -- Griffith, IA

FILE: c:\project\acs\skt\hst\TARATOX.WK4

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
1,1,1-Trichloroethane		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	E	10/01/98
1,1,2,2-Tetrachloroethane	5.7E-005	(ug/m3) <sup>-1</sup>	3,500	2.0E-001	(mg/kg-day) <sup>-1</sup>	C	I	10/01/98
1,1,2-Trichloroethane	1.6E-005	(ug/m3) <sup>-1</sup>	3,500	5.6E-002	(mg/kg-day) <sup>-1</sup>	C	I	10/01/98
1,1-Dichloroethane		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	C	A	10/01/98
1,2,4-Trichlorobenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	H	10/01/98
1,2,4-Trimethylbenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		E	10/01/98
1,2-Dichlorobenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	E	10/01/98
1,2-Dichloroethane	2.6E-005	(ug/m3) <sup>-1</sup>	3,500	9.1E-002	(mg/kg-day) <sup>-1</sup>	B2	E	10/01/98
1,2-Dichloroethene(mixture)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
1,2-Dichloropropane		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
1,3,5-Trimethylbenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		E	10/01/98
1,3-Dichlorobenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	E	10/01/98
1,4-Dichlorobenzene	6.3E-006	(ug/m3) <sup>-1</sup>	3,500	2.2E-002	(mg/kg-day) <sup>-1</sup>	C	I	10/01/98
2,2'-oxybis(1-Chloropropane)	1.0E-005	(ug/m3) <sup>-1</sup>	3,500	3.5E-002	(mg/kg-day) <sup>-1</sup>	C	H	10/01/98
2,4,5-Trichlorophenol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
2,4-Dichlorophenol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
2,4-Dimethylphenol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
2,4-Dinitrotoluene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
2,6-Dinitrotoluene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2	O	
2-Butanone (MEK)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	I	10/01/98
2-Hexanone		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		E	10/01/98
2-Methylnaphthalene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
2-Methylphenol (O-Cresol)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	C		
3,3-Dichlorobenzidine		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
4,4'-DDD		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
4,4'-DDE		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
4,4'-DDT	9.7E-005	(ug/m3) <sup>-1</sup>	3,500	3.4E-001	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
4-Methyl-2-Pentanone		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		A	10/01/98
4-Methylphenol (P-Cresol)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	C		
4-Nitrophenol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Acenaphthene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Acetone		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Aldrin	4.9E-003	(ug/m3) <sup>-1</sup>	3,500	1.7E+001	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Alpha-BHC	1.8E-003	(ug/m3) <sup>-1</sup>	3,500	6.3E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Alpha-Chlordane	1.0E-004	(ug/m3) <sup>-1</sup>	3,500	3.5E-001	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Aluminum		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		E	10/01/98
Ammonia		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		I	10/01/98
Anthracene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Antimony		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Arochlor-1242	5.7E-004	(ug/m3) <sup>-1</sup>	3,500	2.0E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Arochlor-1248	5.7E-004	(ug/m3) <sup>-1</sup>	3,500	2.0E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Arochlor-1254	5.7E-004	(ug/m3) <sup>-1</sup>	3,500	2.0E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Arochlor-1260	5.7E-004	(ug/m3) <sup>-1</sup>	3,500	2.0E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Arsenic	4.3E-003	(ug/m3) <sup>-1</sup>	3,500	1.5E+001	(mg/kg-day) <sup>-1</sup>	A	I	10/01/98
Barium		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	A	10/01/98
Benzene	8.3E-006	(ug/m3) <sup>-1</sup>	3,500	2.9E-002	(mg/kg-day) <sup>-1</sup>	A	E	10/01/98
Benzo(a)Anthracene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Benzo(a)Pyrene	8.9E-004	(ug/m3) <sup>-1</sup>	3,500	3.1E+000	(mg/kg-day) <sup>-1</sup>	B2	E	10/01/98
Benzo(b)Fluoranthene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Benzo(k)Fluoranthene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Benzoic Acid		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Benzyl Alcohol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			

TABLE 4-4  
Adult/Child CANCER TOXICITY DATA – INHALATION  
ACS Site – Grnffith, IA

FILE: c:\projec\acs\stb\stb\TARATOX.WK4

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Beryllium	2.4E-003	(ug/m3) <sup>-1</sup>	3,500	8.4E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Beta-BHC	5.1E-004	(ug/m3) <sup>-1</sup>	3,500	1.8E+000	(mg/kg-day) <sup>-1</sup>	B1	I	10/01/98
bis(2-Chloroethyl)Ether	3.1E-004	(ug/m3) <sup>-1</sup>	3,500	1.1E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
bis(2-Ethylhexyl)Phthalate	4.0E-006	(ug/m3) <sup>-1</sup>	3,500	1.4E-002	(mg/kg-day) <sup>-1</sup>	B2	E	10/01/98
Bromodichloromethane		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2	O	
Butyl Benzyl Phthalate		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	C		
Cadmium (food)	1.8E-003	(ug/m3) <sup>-1</sup>	3,500	6.3E+000	(mg/kg-day) <sup>-1</sup>	B1	I	10/01/98
Cadmium (water)	1.8E-003	(ug/m3) <sup>-1</sup>	3,500	6.3E+000	(mg/kg-day) <sup>-1</sup>	B1	I	10/01/98
Carbazole		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Carbon Disulfide		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		I	10/01/98
Chlorobenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	A	10/01/98
Chloroethane		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		I	10/01/98
Chloroform	2.3E-005	(ug/m3) <sup>-1</sup>	3,500	8.1E-002	(mg/kg-day) <sup>-1</sup>	B2	E	10/01/98
Chloromethane	1.8E-006	(ug/m3) <sup>-1</sup>	3,500	6.3E-003	(mg/kg-day) <sup>-1</sup>	C	H	10/01/98
Chromium (III)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Chromium (VI)	1.2E-002	(ug/m3) <sup>-1</sup>	3,500	4.1E+001	(mg/kg-day) <sup>-1</sup>	A	H	10/01/98
Chrysene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
cis-1,2-Dichloroethene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Cobalt		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Copper		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Cyanide		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Di-n-Butylphthalate		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Di-n-Octyl Phthalate		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Dibenzo(a,h)Anthracene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Dibenzofuran		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Dieldnn	4.6E-003	(ug/m3) <sup>-1</sup>	3,500	1.6E+001	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Diethylphthalate		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Dimethylphthalate		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Endosulfan		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Endnn		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Ethylbenzene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	I	10/01/98
Fluoranthene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Fluorene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Gamma-BHC		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2-C		
Gamma-Chlordane	1.0E-004	(ug/m3) <sup>-1</sup>	3,500	3.5E-001	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Heptachlor	1.3E-003	(ug/m3) <sup>-1</sup>	3,500	4.5E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Heptachlor epoxide	2.6E-003	(ug/m3) <sup>-1</sup>	3,500	9.1E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Hexachlorobenzene	4.6E-004	(ug/m3) <sup>-1</sup>	3,500	1.6E+000	(mg/kg-day) <sup>-1</sup>	B2	I	10/01/98
Hexachlorobutadiene	2.2E-005	(ug/m3) <sup>-1</sup>	3,500	7.8E-002	(mg/kg-day) <sup>-1</sup>	C	I	10/01/98
Indeno(1,2,3-cd)Pyrene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Iron		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Isophorone		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	C		
Lead		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
m,p-xylene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Manganese (nonfood)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	I	10/01/98
Mercury		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	I	10/01/98
Methoxychlor		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Methylene Chloride	4.7E-007	(ug/m3) <sup>-1</sup>	3,500	1.7E-003	(mg/kg-day) <sup>-1</sup>	B2	H	10/01/98
Naphthalene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	I	10/01/98
Nickel		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	A		
Nitrate/Nitrite		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
N-Nitrosodiphenylamine		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		

TABLE 4-4  
Adult/Child CANCER TOXICITY DATA -- INHALATION  
ACS Site -- Griffith, IA

FILE: c:\project\acs\skt\bt\TARATOX.WK4

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
ortho-xylene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Pentachlorophenol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	B2		
Phenanthrene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Phenol		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Pyrene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Selenium		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Silver		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Styrene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>		I	10/01/98
Tetrachloroethene	5.7E-007	(ug/m3) <sup>-1</sup>	3,500	2.0E-003	(mg/kg-day) <sup>-1</sup>	C-B2	E	10/01/98
Thallium		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Toluene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D	I	10/01/98
trans-1,2-Dichloroethene		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Trichloroethene	1.7E-006	(ug/m3) <sup>-1</sup>	3,500	6.0E-003	(mg/kg-day) <sup>-1</sup>	C-B2	E	10/01/98
Vanadium		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>			
Vinyl Chloride	8.6E-005	(ug/m3) <sup>-1</sup>	3,500	3.0E-001	(mg/kg-day) <sup>-1</sup>	A	H	10/01/98
Xylene (mixed)		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		
Zinc		(ug/m3) <sup>-1</sup>	3,500		(mg/kg-day) <sup>-1</sup>	D		

NA = Not Applicable

\* E = EPA - ECAO

H = Health Effects Assessment Summary Tables (HEAST)

I = Integrated Risk Information System (IRIS)

(1) Adjustment Factor applied to Unit Risk to calculate

Inhalation Slope Factor = 70kg x 1/20m3/day x 1000ug/mg

(2) Date of most recent search of IRIS or most recent EPA-ECAO provisional value E - Evidence of noncarcinogenicity

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

Table 5-3-1  
CALCULATION OF NONCANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 1, Surface Water (Fire Pond)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: cfworkr1AA.123

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Conc.	Reference Conc. Units	Hazard Quotient
Ingestion	Acetone	5.0E-003	mg/L	5.0E-003	mg/L	M	4.7E-007	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	4.7E-006
	Aluminum	9.6E-001	mg/L	9.6E-001	mg/L	M	9.0E-005	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	9.0E-005
	Ammonia	3.3E-001	mg/L	3.3E-001	mg/L	M	3.1E-005	mg/kg-day			N/A	N/A	
	Aroclor-1248	8.4E-004	mg/L	8.4E-004	mg/L	M	7.9E-008	mg/kg-day			N/A	N/A	
	Cadmium	7.2E-004	mg/L	7.2E-004	mg/L	M	6.8E-008	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	1.4E-004
	Chromium (total)	8.3E-002	mg/L	8.3E-002	mg/L	M	7.8E-006	mg/kg-day	3.0E-003	mg/kg-day	N/A	N/A	2.6E-003
	Copper	2.2E-002	mg/L	2.2E-002	mg/L	M	2.1E-006	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	5.2E-005
	Dichloroethane, 1,1-	2.0E-003	mg/L	2.0E-003	mg/L	M	1.9E-007	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	1.9E-006
	Dichloroethene, 1,2-	1.0E-003	mg/L	1.0E-003	mg/L	M	9.4E-008	mg/kg-day	9.0E-003	mg/kg-day	N/A	N/A	1.0E-005
	Iron	8.5E-001	mg/L	8.5E-001	mg/L	M	8.0E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	2.7E-004
	Lead	2.4E-002	mg/L	2.4E-002	mg/L	M	2.2E-006	mg/kg-day			N/A	N/A	
	Manganese	5.8E-002	mg/L	5.8E-002	mg/L	M	5.4E-006	mg/kg-day	1.4E-001	mg/kg-day	N/A	N/A	3.9E-005
	2-Butanone	3.3E-002	mg/L	3.3E-002	mg/L	M	3.1E-006	mg/kg-day	6.0E-001	mg/kg-day	N/A	N/A	5.2E-006
	Nitrate/Nitrite	2.5E-001	mg/L	2.5E-001	mg/L	M	2.3E-005	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	2.3E-004
	Zinc	6.1E-002	mg/L	6.1E-002	mg/L	M	5.7E-006	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.9E-005
	(Total)												3.5E-003
Dermal	Acetone	5.0E-003	mg/L	5.0E-003	mg/L	M	4.3E-008	mg/kg-day	7.9E-002	mg/kg-day	N/A	N/A	5.5E-007
	Aluminum	9.6E-001	mg/L	9.6E-001	mg/L	M	1.0E-005	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.0E-005
	Ammonia	3.3E-001	mg/L	3.3E-001	mg/L	M					N/A	N/A	
	Aroclor-1248	8.4E-004	mg/L	8.4E-004	mg/L	M	4.1E-005	mg/kg-day			N/A	N/A	
	Cadmium	7.2E-004	mg/L	7.2E-004	mg/L	M	7.8E-009	mg/kg-day	2.5E-005	mg/kg-day	N/A	N/A	3.1E-004
	Chromium (total)	8.3E-002	mg/L	8.3E-002	mg/L	M	9.0E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.0E-003
	Copper	2.2E-002	mg/L	2.2E-002	mg/L	M	2.4E-007	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.0E-005
	Dichloroethane, 1,1-	2.0E-003	mg/L	2.0E-003	mg/L	M	3.3E-007	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	3.3E-006
	Dichloroethene, 1,2-	1.0E-003	mg/L	1.0E-003	mg/L	M	1.8E-007	mg/kg-day	9.0E-003	mg/kg-day	N/A	N/A	2.0E-005
	Iron	8.5E-001	mg/L	8.5E-001	mg/L	M	9.3E-006	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	3.1E-005
	Lead	2.4E-002	mg/L	2.4E-002	mg/L	M	1.0E-009	mg/kg-day			N/A	N/A	
	Manganese	5.8E-002	mg/L	5.8E-002	mg/L	M	6.3E-007	mg/kg-day	1.4E-001	mg/kg-day	N/A	N/A	4.5E-006
	2-Butanone	3.3E-002	mg/L	3.3E-002	mg/L	M	5.9E-007	mg/kg-day	5.7E-001	mg/kg-day	N/A	N/A	1.0E-006
	Nitrate/Nitrite	2.5E-001	mg/L	2.5E-001	mg/L	M			3.0E-003	mg/kg-day	N/A	N/A	
	Zinc	6.1E-002	mg/L	6.1E-002	mg/L	M	4.0E-007	mg/kg-day	9.0E-002	mg/kg-day	N/A	N/A	4.4E-006
	(Total)												3.4E-003
Total Hazard Index Across All Exposure Routes/Pathways													6.9E-003

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.



Table 5-3-2  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 1, Surface Water (Fire Pond)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: c:\work\1AA.123

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risks Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Units	Cancer Risk
Ingestion	Acetone	5.00E-003	mg/L	5.00E-003	mg/L	M	4.2E-008	mg/kg-day	2.0E+000	kg-day/mg	1.4E-008
	Aluminum	9.60E-001	mg/L	9.60E-001	mg/L	M	8.1E-006	mg/kg-day			
	Ammonia	3.30E-001	mg/L	3.30E-001	mg/L	M	2.8E-006	mg/kg-day			
	Aroclor-1248	8.40E-004	mg/L	8.40E-004	mg/L	M	7.0E-009	mg/kg-day			
	Cadmium	7.20E-004	mg/L	7.20E-004	mg/L	M	6.0E-009	mg/kg-day			
	Chromium (total)	8.30E-002	mg/L	8.30E-002	mg/L	M	7.0E-007	mg/kg-day			
	Copper	2.2E-002	mg/L	2.20E-002	mg/L	M	1.8E-007	mg/kg-day			
	Dichloroethane, 1,1-	2.0E-003	mg/L	2.00E-003	mg/L	M	1.7E-008	mg/kg-day			
	Dichloroethene, 1,2-	1.0E-003	mg/L	1.00E-003	mg/L	M	8.4E-009	mg/kg-day			
	Iron	8.5E-001	mg/L	8.51E-001	mg/L	M	7.1E-006	mg/kg-day			
	Lead	2.4E-002	mg/L	2.38E-002	mg/L	M	2.0E-007	mg/kg-day			
	Manganese	5.8E-002	mg/L	5.80E-002	mg/L	M	4.9E-007	mg/kg-day			
	2-Butanone	3.3E-002	mg/L	3.30E-002	mg/L	M	2.8E-007	mg/kg-day			
	Nitrate/Nitrite	2.5E-001	mg/L	2.50E-001	mg/L	M	2.1E-006	mg/kg-day			
	Zinc	6.1E-002	mg/L	6.10E-002	mg/L	M	5.1E-007	mg/kg-day			
	(Total)										1.4E-008
Dermal	Acetone	5.00E-003	mg/L	5.00E-003	mg/L	M	3.9E-009	mg/kg-day	2.0E+000	kg-day/mg	7.4E-006
	Aluminum	9.6E-001	mg/L	9.60E-001	mg/L	M	9.3E-007	mg/kg-day			
	Ammonia	3.3E-001	mg/L	3.30E-001	mg/L	M					
	Aroclor-1248	8.4E-004	mg/L	8.40E-004	mg/L	M	3.7E-006	mg/kg-day			
	Cadmium	7.2E-004	mg/L	7.20E-004	mg/L	M	7.0E-010	mg/kg-day			
	Chromium (total)	8.3E-002	mg/L	8.30E-002	mg/L	M	8.1E-008	mg/kg-day			
	Copper	2.20E-002	mg/L	2.20E-002	mg/L	M	2.1E-008	mg/kg-day			
	Dichloroethane, 1,1-	2.00E-003	mg/L	2.00E-003	mg/L	M	2.9E-008	mg/kg-day			
	Dichloroethene, 1,2-	1.00E-003	mg/L	1.00E-003	mg/L	M	1.6E-008	mg/kg-day			
	Iron	8.51E-001	mg/L	8.51E-001	mg/L	M	8.3E-007	mg/kg-day			
	Lead	2.38E-002	mg/L	2.38E-002	mg/L	M	9.3E-011	mg/kg-day			
	Manganese	5.80E-002	mg/L	5.80E-002	mg/L	M	5.6E-008	mg/kg-day			
	2-Butanone	3.30E-002	mg/L	3.30E-002	mg/L	M	5.2E-008	mg/kg-day			
	Nitrate/Nitrite	2.50E-001	mg/L	2.50E-001	mg/L	M					
	Zinc	6.10E-002	mg/L	6.10E-002	mg/L	M	3.6E-008	mg/kg-day			
	(Total)										7.4E-006
Total Hazard Index Across All Exposure Routes/Pathways											7.4E-006

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Specify if subchronic.

Table 5-3-3  
CALCULATION OF NONCANCER HAZARDS  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 1, Surface Water (Fire Pond)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: cfwrkct1.WK4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Conc.	Reference Conc. Units	Hazard Quotient
Ingestion	Acetone	5.0E-003	mg/L	5.0E-003	mg/L	M	8.6E-006	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	8.6E-005
	Aluminum	9.6E-001	mg/L	9.6E-001	mg/L	M	1.6E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.6E-003
	Ammonia	3.3E-001	mg/L	3.3E-001	mg/L	M	5.7E-004	mg/kg-day			N/A	N/A	
	Aroclor-1248	8.4E-004	mg/L	8.4E-004	mg/L	M	1.4E-006	mg/kg-day			N/A	N/A	
	Cadmium	7.2E-004	mg/L	7.2E-004	mg/L	M	1.2E-006	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	2.5E-003
	Chromium (total)	8.3E-002	mg/L	8.3E-002	mg/L	M	1.4E-004	mg/kg-day	3.0E-003	mg/kg-day	N/A	N/A	4.7E-002
	Copper	2.2E-002	mg/L	2.2E-002	mg/L	M	3.8E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.4E-004
	Dichloroethane, 1,1-	2.0E-003	mg/L	2.0E-003	mg/L	M	3.4E-006	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	3.4E-005
	Dichloroethene, 1,2-	1.0E-003	mg/L	1.0E-003	mg/L	M	1.7E-006	mg/kg-day	9.0E-003	mg/kg-day	N/A	N/A	1.9E-004
	Iron	8.5E-001	mg/L	8.5E-001	mg/L	M	1.5E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	4.9E-003
	Lead	2.4E-002	mg/L	2.4E-002	mg/L	M	4.1E-005	mg/kg-day			N/A	N/A	
	Manganese	5.8E-002	mg/L	5.8E-002	mg/L	M	9.9E-005	mg/kg-day	1.4E-001	mg/kg-day	N/A	N/A	7.1E-004
	2-Butanone	3.3E-002	mg/L	3.3E-002	mg/L	M	5.7E-005	mg/kg-day	6.0E-001	mg/kg-day	N/A	N/A	9.4E-005
	Nitrate/Nitrite	2.5E-001	mg/L	2.5E-001	mg/L	M	4.3E-004	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	4.3E-003
	Zinc	6.1E-002	mg/L	6.1E-002	mg/L	M	1.0E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	3.5E-004
	(Total)												6.3E-002
Dermal	Acetone	5.0E-003	mg/L	5.0E-003	mg/L	M	6.8E-007	mg/kg-day	7.9E-002	mg/kg-day	N/A	N/A	8.7E-006
	Aluminum	9.6E-001	mg/L	9.6E-001	mg/L	M	1.6E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.6E-004
	Ammonia	3.3E-001	mg/L	3.3E-001	mg/L	M					N/A	N/A	
	Aroclor-1248	8.4E-004	mg/L	8.4E-004	mg/L	M	6.5E-004	mg/kg-day			N/A	N/A	
	Cadmium	7.2E-004	mg/L	7.2E-004	mg/L	M	1.2E-007	mg/kg-day	2.5E-005	mg/kg-day	N/A	N/A	4.9E-003
	Chromium (total)	8.3E-002	mg/L	8.3E-002	mg/L	M	1.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.7E-002
	Copper	2.2E-002	mg/L	2.2E-002	mg/L	M	3.8E-006	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.6E-004
	Dichloroethane, 1,1-	2.0E-003	mg/L	2.0E-003	mg/L	M	5.2E-006	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	5.2E-005
	Dichloroethene, 1,2-	1.0E-003	mg/L	1.0E-003	mg/L	M	2.9E-006	mg/kg-day	9.0E-003	mg/kg-day	N/A	N/A	3.2E-004
	Iron	8.5E-001	mg/L	8.5E-001	mg/L	M	1.5E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	4.9E-004
	Lead	2.4E-002	mg/L	2.4E-002	mg/L	M	1.6E-008	mg/kg-day			N/A	N/A	
	Manganese	5.8E-002	mg/L	5.8E-002	mg/L	M	9.9E-006	mg/kg-day	1.4E-001	mg/kg-day	N/A	N/A	7.1E-005
	2-Butanone	3.3E-002	mg/L	3.3E-002	mg/L	M	9.2E-006	mg/kg-day	5.7E-001	mg/kg-day	N/A	N/A	1.6E-005
	Nitrate/Nitrite	2.5E-001	mg/L	2.5E-001	mg/L	M			3.0E-003	mg/kg-day	N/A	N/A	
	Zinc	6.1E-002	mg/L	6.1E-002	mg/L	M	6.3E-006	mg/kg-day	9.0E-002	mg/kg-day	N/A	N/A	7.0E-005
	(Total)												5.4E-002
Total Hazard Index Across All Exposure Routes/Pathways													1.2E-001

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.

Table 5-3-4  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 1, Surface Water (Fire Pond)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: ctwrket1.WK4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risks Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Units	Cancer Risk
Ingestion	Acetone	5.00E-003	mg/L	5.00E-003	mg/L	M	1.5E-007	mg/kg-day	2.0E+000	kg-day/mg	5.1E-008
	Aluminum	9.60E-001	mg/L	9.60E-001	mg/L	M	2.9E-005	mg/kg-day			
	Ammonia	3.30E-001	mg/L	3.30E-001	mg/L	M	1.0E-005	mg/kg-day			
	Aroclor-1248	8.40E-004	mg/L	8.40E-004	mg/L	M	2.6E-008	mg/kg-day			
	Cadmium	7.20E-004	mg/L	7.20E-004	mg/L	M	2.2E-008	mg/kg-day			
	Chromium (total)	8.30E-002	mg/L	8.30E-002	mg/L	M	2.5E-006	mg/kg-day			
	Copper	2.2E-002	mg/L	2.20E-002	mg/L	M	6.7E-007	mg/kg-day			
	Dichloroethane, 1,1-	2.0E-003	mg/L	2.00E-003	mg/L	M	6.1E-008	mg/kg-day			
	Dichloroethene, 1,2-	1.0E-003	mg/L	1.00E-003	mg/L	M	3.1E-008	mg/kg-day			
	Iron	8.5E-001	mg/L	8.51E-001	mg/L	M	2.6E-005	mg/kg-day			
	Lead	2.4E-002	mg/L	2.38E-002	mg/L	M	7.3E-007	mg/kg-day			
	Manganese	5.8E-002	mg/L	5.80E-002	mg/L	M	1.8E-006	mg/kg-day			
	2-Butanone	3.3E-002	mg/L	3.30E-002	mg/L	M	1.0E-006	mg/kg-day			
	Nitrate/Nitrite	2.5E-001	mg/L	2.50E-001	mg/L	M	7.7E-006	mg/kg-day			
	Zinc	6.1E-002	mg/L	6.10E-002	mg/L	M	1.9E-006	mg/kg-day			
	(Total)										5.1E-008
Dermal	Acetone	5.00E-003	mg/L	5.00E-003	mg/L	M	1.2E-008	mg/kg-day	2.0E+000	kg-day/mg	2.3E-005
	Aluminum	9.6E-001	mg/L	9.60E-001	mg/L	M	2.9E-006	mg/kg-day			
	Ammonia	3.3E-001	mg/L	3.30E-001	mg/L	M					
	Aroclor-1248	8.4E-004	mg/L	8.40E-004	mg/L	M	1.2E-005	mg/kg-day			
	Cadmium	7.2E-004	mg/L	7.20E-004	mg/L	M	2.2E-009	mg/kg-day			
	Chromium (total)	8.3E-002	mg/L	8.30E-002	mg/L	M	2.5E-007	mg/kg-day			
	Copper	2.20E-002	mg/L	2.20E-002	mg/L	M	6.7E-008	mg/kg-day			
	Dichloroethane, 1,1-	2.00E-003	mg/L	2.00E-003	mg/L	M	9.3E-008	mg/kg-day			
	Dichloroethene, 1,2-	1.00E-003	mg/L	1.00E-003	mg/L	M	5.2E-008	mg/kg-day			
	Iron	8.51E-001	mg/L	8.51E-001	mg/L	M	2.6E-006	mg/kg-day			
	Lead	2.38E-002	mg/L	2.38E-002	mg/L	M	2.9E-010	mg/kg-day			
	Manganese	5.80E-002	mg/L	5.80E-002	mg/L	M	1.8E-007	mg/kg-day			
	2-Butanone	3.30E-002	mg/L	3.30E-002	mg/L	M	1.6E-007	mg/kg-day			
	Nitrate/Nitrite	2.50E-001	mg/L	2.50E-001	mg/L	M					
	Zinc	6.10E-002	mg/L	6.10E-002	mg/L	M	1.1E-007	mg/kg-day			
	(Total)										2.3E-005
Total Hazard Index Across All Exposure Routes/Pathways											2.3E-005

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.

Table 5-3-23  
CALCULATION OF NONCANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water (Drainage Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: fworkr4b.wk4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Conc.	Reference Conc. Units	Hazard Quotient
Ingestion	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	1.5E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	7.5E-004
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	9.4E-008	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	1.6E-006
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	2.8E-007	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	7.0E-005
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	2.3E-005	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	2.3E-004
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	3.0E-006	mg/kg-day	5.0E-002	mg/kg-day	N/A	N/A	6.0E-005
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	6.6E-007	mg/kg-day	9.0E-002	mg/kg-day	N/A	N/A	7.3E-006
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	5.6E-007	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.9E-005
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	1.0E-006	mg/kg-day	5.0E-002	mg/kg-day	N/A	N/A	2.1E-005
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	9.4E-008	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	3.1E-006
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	9.4E-008	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	3.1E-006
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	1.0E-005	mg/kg-day	3.0E-003	mg/kg-day	N/A	N/A	3.4E-003
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	9.4E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	4.7E-006
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	2.5E-006	mg/kg-day	4.0E-001	mg/kg-day	N/A	N/A	6.3E-006
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	6.6E-007	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	6.6E-005
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	1.8E-005	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	1.8E-003
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	4.7E-007	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	4.7E-006
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	1.5E-006	mg/kg-day	2.0E+000	mg/kg-day	N/A	N/A	7.5E-007
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	7.5E-007	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.8E-005
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	2.7E-006	mg/kg-day	2.0E+000	mg/kg-day	N/A	N/A	1.4E-006
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	9.4E-008	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	9.4E-006
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	4.2E-006	mg/kg-day	2.0E-001	mg/kg-day	N/A	N/A	2.1E-005
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	2.8E-007	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.4E-005
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	2.8E-007	mg/kg-day	6.0E-003	mg/kg-day	N/A	N/A	4.7E-005
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	1.3E-005	mg/kg-day			N/A	N/A	
	(Total)												6.60E-003
Dermal	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	6.2E-005		2.0E-002	mg/kg-day			3.09E-003
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	2.6E-007		4.2E-002	mg/kg-day	N/A	N/A	6.2E-006
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	5.7E-007		3.2E-003	mg/kg-day			1.8E-004
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	4.0E-005	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	4.0E-004
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	1.1E-004		5.0E-002	mg/kg-day	N/A	N/A	2.2E-003
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	1.1E-005	mg/kg-day	9.0E-002	mg/kg-day	N/A	N/A	1.2E-004
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	5.9E-007		3.0E-002	mg/kg-day			2.0E-005
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	2.1E-005		5.0E-002	mg/kg-day	N/A	N/A	4.3E-004

Table 5-3-23  
CALCULATION OF NONCANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water (Drainage Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: fworkr4b.wk4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Conc.	Reference Conc. Units	Hazard Quotient
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	2.2E-006	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	7.3E-005
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	1.6E-006		3.0E-002	mg/kg-day	N/A	N/A	5.2E-005
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	3.8E-005	mg/kg-day	2.7E-003	mg/kg-day	N/A	N/A	1.4E-002
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	8.5E-007	mg/kg-day	6.2E-003	mg/kg-day	N/A	N/A	1.4E-004
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	3.4E-006	mg/kg-day	4.0E-001	mg/kg-day	N/A	N/A	8.5E-006
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	1.3E-006	mg/kg-day	9.6E-003	mg/kg-day	N/A	N/A	1.3E-004
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	3.5E-005		1.0E-002	mg/kg-day	N/A	N/A	3.5E-003
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	7.0E-006	mg/kg-day	9.2E-002	mg/kg-day	N/A	N/A	7.6E-005
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	2.7E-005	mg/kg-day	1.8E+000	mg/kg-day	N/A	N/A	1.4E-005
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	1.2E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	6.1E-004
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	4.9E-005		1.8E+000	mg/kg-day	N/A	N/A	2.6E-005
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	1.4E-006	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	1.4E-004
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	3.7E-005	mg/kg-day	2.0E-001	mg/kg-day	N/A	N/A	1.8E-004
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	5.9E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.9E-006
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	1.1E-006	mg/kg-day	5.9E-003	mg/kg-day	N/A	N/A	1.8E-004
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	1.6E-005	mg/kg-day			N/A	N/A	
	(Total)												2.58E-002
Total Hazard Index Across All Exposure Routes													3.2E-002

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.

Table 5-3-24  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water (Drainage Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: fworkr4b.wk4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risks Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Units	Cancer Risk
Ingestion	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	1.3E-006	kg-day/mg			
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	8.4E-009	kg-day/mg	2.0E-001	kg-day/mg	1.7E-009
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	2.5E-008	kg-day/mg	5.7E-002	kg-day/mg	1.4E-009
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	2.0E-006	kg-day/mg			
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	2.7E-007	kg-day/mg			
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	5.9E-008	kg-day/mg			
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	5.0E-008	kg-day/mg	9.1E-002	kg-day/mg	4.6E-009
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	9.2E-008	kg-day/mg			
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	8.4E-009	kg-day/mg			
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	8.4E-009	kg-day/mg	2.4E-002	kg-day/mg	2.0E-010
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	9.2E-007	kg-day/mg	2.9E-002	kg-day/mg	2.7E-008
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	8.4E-009	kg-day/mg			
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	2.3E-007	kg-day/mg	2.9E-003	kg-day/mg	6.6E-010
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	5.9E-008	kg-day/mg	6.1E-003	kg-day/mg	3.6E-010
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	1.6E-006	kg-day/mg			
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	4.2E-008	kg-day/mg			
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	1.3E-007	kg-day/mg			
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	6.7E-008	kg-day/mg			
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	2.4E-007	kg-day/mg			
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	8.4E-009	kg-day/mg	5.2E-002	kg-day/mg	4.4E-010
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	3.8E-007	kg-day/mg			
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	2.5E-008	kg-day/mg			
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	2.5E-008	kg-day/mg	1.1E-002	kg-day/mg	2.8E-010
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	1.2E-006	kg-day/mg	1.9E+000	kg-day/mg	2.2E-006
	(Total)										2.3E-006
Dermal	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	5.5E-006	kg-day/mg			
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	2.3E-008	kg-day/mg	2.9E-001	kg-day/mg	6.6E-009
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	5.1E-008	kg-day/mg	7.0E-002	kg-day/mg	3.6E-009
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	3.5E-006	kg-day/mg			
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	1.0E-005	kg-day/mg			
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	9.5E-007	kg-day/mg			
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	5.3E-008	kg-day/mg	9.1E-002	kg-day/mg	4.8E-009
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	1.9E-006	kg-day/mg			

Table 5-3-24  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water (Drainage Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: fworkr4b.wk4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risks Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Units	Cancer Risk
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	1.9E-007	kg-day/mg			
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	1.4E-007	kg-day/mg	2.4E-002	kg-day/mg	3.3E-009
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	3.4E-006	kg-day/mg	3.2E-002	kg-day/mg	1.1E-007
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	7.6E-008	kg-day/mg			
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	3.0E-007	kg-day/mg	2.9E-003	kg-day/mg	8.8E-010
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	1.1E-007	kg-day/mg	6.4E-003	kg-day/mg	7.3E-010
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	3.1E-006	kg-day/mg			
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	6.2E-007	kg-day/mg			
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	2.4E-006	kg-day/mg			
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	1.1E-006	kg-day/mg			
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	4.3E-006	kg-day/mg			
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	1.2E-007	kg-day/mg	5.2E-002	kg-day/mg	6.4E-009
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	3.3E-006	kg-day/mg			
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	5.3E-009	kg-day/mg			
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	9.6E-008	kg-day/mg	1.1E-002	kg-day/mg	1.1E-009
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	1.4E-006	kg-day/mg	1.9E+000	kg-day/mg	2.7E-006
	(Total)										2.8E-006
Total Hazard Index Across All Exposure Routes/Pathways											5.1E-006

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.

Table 5-3-25  
CALCULATION OF NONCANCER HAZARDS  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water (Drainage Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: FWRKCT4B.WK4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Conc.	Reference Conc. Units	Hazard Quotient
Ingestion	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	3.8E-006	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.9E-004
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	2.3E-008	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	3.9E-007
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	7.0E-008	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.8E-005
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	5.6E-006	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	5.6E-005
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	7.5E-007	mg/kg-day	5.0E-002	mg/kg-day	N/A	N/A	1.5E-005
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	1.6E-007	mg/kg-day	9.0E-002	mg/kg-day	N/A	N/A	1.8E-006
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	1.4E-007	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	4.7E-006
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	2.6E-007	mg/kg-day	5.0E-002	mg/kg-day	N/A	N/A	5.2E-006
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	2.3E-008	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	7.8E-007
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	2.3E-008	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	7.8E-007
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	2.6E-006	mg/kg-day	3.0E-003	mg/kg-day	N/A	N/A	8.6E-004
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	2.3E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.2E-006
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	6.3E-007	mg/kg-day	4.0E-001	mg/kg-day	N/A	N/A	1.6E-006
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	1.6E-007	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	1.6E-005
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	4.5E-006	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	4.5E-004
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	1.2E-007	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	1.2E-006
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	3.8E-007	mg/kg-day	2.0E+000	mg/kg-day	N/A	N/A	1.9E-007
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	1.9E-007	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	9.4E-006
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	6.8E-007	mg/kg-day	2.0E+000	mg/kg-day	N/A	N/A	3.4E-007
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	2.3E-008	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	2.3E-006
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	1.1E-006	mg/kg-day	2.0E-001	mg/kg-day	N/A	N/A	5.3E-006
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	7.0E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.5E-006
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	7.0E-008	mg/kg-day	6.0E-003	mg/kg-day	N/A	N/A	1.2E-005
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	3.3E-006	mg/kg-day			N/A	N/A	1.65E-003
	(Total)												
Dermal	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	1.3E-005		2.0E-002	mg/kg-day			6.67E-004
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	5.6E-008		4.2E-002	mg/kg-day	N/A	N/A	1.3E-006
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	1.2E-007		3.2E-003	mg/kg-day			3.8E-005
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	8.5E-006	mg/kg-day	1.0E-001	mg/kg-day	N/A	N/A	8.5E-005
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	2.4E-005		5.0E-002	mg/kg-day	N/A	N/A	4.8E-004
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	2.3E-006	mg/kg-day	9.0E-002	mg/kg-day	N/A	N/A	2.6E-005
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	1.3E-007		3.0E-002	mg/kg-day			4.2E-006



Table 5-3-25  
CALCULATION OF NONCANCER HAZARDS  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	Area 4B, Surface Water (Drainage Ditch)
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: FWRKCT4B.WK4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Conc.	Reference Conc. Units	Hazard Quotient
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	4.6E-006		5.0E-002	mg/kg-day	N/A	N/A	9.2E-005
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	4.7E-007	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.6E-005
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	3.3E-007		3.0E-002	mg/kg-day	N/A	N/A	1.1E-005
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	8.3E-006	mg/kg-day	2.7E-003	mg/kg-day	N/A	N/A	3.1E-003
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	1.8E-007	mg/kg-day	6.2E-003	mg/kg-day	N/A	N/A	3.0E-005
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	7.3E-007	mg/kg-day	4.0E-001	mg/kg-day	N/A	N/A	1.8E-006
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	2.8E-007	mg/kg-day	9.6E-003	mg/kg-day	N/A	N/A	2.9E-005
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	7.5E-006		1.0E-002	mg/kg-day	N/A	N/A	7.5E-004
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	1.5E-006	mg/kg-day	9.2E-002	mg/kg-day	N/A	N/A	1.6E-005
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	5.7E-006	mg/kg-day	1.8E+000	mg/kg-day	N/A	N/A	3.1E-006
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	2.6E-006	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.3E-004
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	1.0E-005		1.8E+000	mg/kg-day	N/A	N/A	5.7E-006
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	3.0E-007	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	3.0E-005
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	7.9E-006	mg/kg-day	2.0E-001	mg/kg-day	N/A	N/A	3.9E-005
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	1.3E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	6.3E-007
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	2.3E-007	mg/kg-day	5.9E-003	mg/kg-day	N/A	N/A	3.9E-005
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	3.4E-006	mg/kg-day			N/A	N/A	
	(Total)												5.56E-003
Total Hazard Index Across All Exposure Routes													7.2E-003

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.

Table 5-3-26  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	Area 4B, Surface Water (Drainage Ditch)
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: FWRKCT4B.WK4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risks Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Units	Cancer Risk
Ingestion	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	6.7E-008	kg-day/mg			
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	4.2E-010	kg-day/mg	2.0E-001	kg-day/mg	8.4E-011
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	1.3E-009	kg-day/mg	5.7E-002	kg-day/mg	7.2E-011
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	1.0E-007	kg-day/mg			
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	1.3E-008	kg-day/mg			
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	2.9E-009	kg-day/mg			
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	2.5E-009	kg-day/mg	9.1E-002	kg-day/mg	2.3E-010
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	4.6E-009	kg-day/mg			
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	4.2E-010	kg-day/mg			
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	4.2E-010	kg-day/mg	2.4E-002	kg-day/mg	1.0E-011
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	4.6E-008	kg-day/mg	2.9E-002	kg-day/mg	1.3E-009
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	4.2E-010	kg-day/mg			
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	1.1E-008	kg-day/mg	2.9E-003	kg-day/mg	3.3E-011
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	2.9E-009	kg-day/mg	6.1E-003	kg-day/mg	1.8E-011
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	8.0E-008	kg-day/mg			
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	2.1E-009	kg-day/mg			
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	6.7E-009	kg-day/mg			
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	3.4E-009	kg-day/mg			
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	1.2E-008	kg-day/mg			
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	4.2E-010	kg-day/mg	5.2E-002	kg-day/mg	2.2E-011
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	1.9E-008	kg-day/mg			
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	1.3E-009	kg-day/mg			
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	1.3E-009	kg-day/mg	1.1E-002	kg-day/mg	1.4E-011
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	5.9E-008	kg-day/mg	1.9E+000	kg-day/mg	1.1E-007
	(Total)										1.1E-007
Dermal	1,1,1-Trichloroethane	1.6E-001	mg/L	1.6E-001	mg/L	M	2.4E-007	kg-day/mg			
	1,1,2,2-Tetrachloroethane	1.0E-003	mg/L	1.0E-003	mg/L	M	1.0E-009	kg-day/mg	2.9E-001	kg-day/mg	2.9E-010
	1,1,2-Trichloroethane	3.0E-003	mg/L	3.0E-003	mg/L	M	2.2E-009	kg-day/mg	7.0E-002	kg-day/mg	1.6E-010
	1,1-Dichloroethane	2.4E-001	mg/L	2.4E-001	mg/L	M	1.5E-007	kg-day/mg			
	1,2,4-Trimethylbenzene	3.2E-002	mg/L	3.2E-002	mg/L	M	4.3E-007	kg-day/mg			
	1,2-Dichlorobenzene	7.0E-003	mg/L	7.0E-003	mg/L	M	4.1E-008	kg-day/mg			
	1,2-Dichloroethane	6.0E-003	mg/L	6.0E-003	mg/L	M	2.3E-009	kg-day/mg	9.1E-002	kg-day/mg	2.1E-010

Table 5-3-26  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Area 4B, Surface Water (Drainage Ditch)  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: FWRKCT4B.WK4

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risks Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Units	Cancer Risk
	1,3,5-Trimethylbenzene	1.1E-002	mg/L	1.1E-002	mg/L	M	8.2E-008	kg-day/mg			
	1,3-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	8.4E-009	kg-day/mg			
	1,4-Dichlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	6.0E-009	kg-day/mg	2.4E-002	kg-day/mg	1.4E-010
	Benzene	1.1E-001	mg/L	1.1E-001	mg/L	M	1.5E-007	kg-day/mg	3.2E-002	kg-day/mg	4.8E-009
	Chlorobenzene	1.0E-003	mg/L	1.0E-003	mg/L	M	3.3E-009	kg-day/mg			
	Chloroethane	2.7E-002	mg/L	2.7E-002	mg/L	M	1.3E-008	kg-day/mg	2.9E-003	kg-day/mg	3.8E-011
	Chloroform	7.0E-003	mg/L	7.0E-003	mg/L	M	5.0E-009	kg-day/mg	6.4E-003	kg-day/mg	3.2E-011
	cis-1,2-Dichloroethene	1.9E-001	mg/L	1.9E-001	mg/L	M	1.3E-007	kg-day/mg			
	Ethyl Benzene	5.0E-003	mg/L	5.0E-003	mg/L	M	2.7E-008	kg-day/mg			
	m,p-xylene	1.6E-002	mg/L	1.6E-002	mg/L	M	1.0E-007	kg-day/mg			
	Naphthalene	8.0E-003	mg/L	8.0E-003	mg/L	M	4.7E-008	kg-day/mg			
	ortho-xylene	2.9E-002	mg/L	2.9E-002	mg/L	M	1.9E-007	kg-day/mg			
	Tetrachloroethene	1.0E-003	mg/L	1.0E-003	mg/L	M	5.3E-009	kg-day/mg	5.2E-002	kg-day/mg	2.7E-010
	Toluene	4.5E-002	mg/L	4.5E-002	mg/L	M	1.4E-007	kg-day/mg			
	trans-1,2-Dichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	2.3E-010	kg-day/mg			
	Trichloroethene	3.0E-003	mg/L	3.0E-003	mg/L	M	4.1E-009	kg-day/mg	1.1E-002	kg-day/mg	4.6E-011
	Vinyl Chloride	1.4E-001	mg/L	1.4E-001	mg/L	M	6.1E-008	kg-day/mg	1.9E+000	kg-day/mg	1.2E-007
	(Total)										1.2E-007
Total Hazard Index Across All Exposure Routes/Pathways											2.4E-007

- (1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Specify if subchronic.

Scenario Timeframe Current/Future  
 Receptor Population Utility Worker  
 Receptor Age: Adult

Table 6-1-1  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area1RME.wk41.TT.sum RWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	2.5E-004	--	1.2E-002	1.3E-002
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	1.2E+000	--	6.0E+001	6.1E+001
			1,1,2-Trichloroethane	1.9E-007	--	1.2E-005	1.2E-005	1,1,2-Trichloroethane	blood disorders	2.3E-003	--	1.4E-001	1.4E-001
			1,1,2,2-Tetrachloroethane	3.1E-007	--	2.3E-005	2.3E-005	1,1,2,2-Tetrachloroethane	liver	7.3E-005	--	5.3E-003	5.3E-003
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	3.5E-004	--	1.8E-002	1.8E-002
			1,2-Dichloroethane	1.5E-006	--	7.4E-005	7.5E-005	1,2-Dichloroethane	fetotoxic	1.5E-003	--	7.6E-002	7.7E-002
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	3.0E-002	--	1.5E+000	1.5E+000
			1,2-Dichloropropane	6.0E-007	--	3.0E-005	3.1E-005	1,2-Dichloropropane	GI tract		--		
			1,2,4-Trichlorobenzene		--			1,2,4-Trichlorobenzene	low body wt	4.8E-004	--	2.4E-002	2.5E-002
			1,3-Dichlorobenzene		--			1,3-Dichlorobenzene	circulatory	3.3E-005	--	1.7E-003	1.7E-003
			1,4-Dichlorobenzene	5.0E-008	--	2.5E-006	2.6E-006	1,4-Dichlorobenzene	GI tract	2.0E-004	--	9.8E-003	1.0E-002
			2-Butanone		--			2-Butanone	liver	1.0E-003	--	5.3E-002	5.4E-002
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	1.8E-002	--	9.1E-001	9.3E-001
			2-Methylphenol		--			2-Methylphenol	liver	2.7E-004	--	1.4E-002	1.4E-002
			2,4-Dichlorophenol		--			2,4-Dichlorophenol	kidney	1.5E-003	--	7.8E-002	7.9E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	6.8E-004	--	3.4E-002	3.5E-002
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	2.1E-002	--	1.1E+000	1.1E+000
			4-Methylphenol		--			4-Methylphenol	respiratory	4.0E-003	--	3.1E-001	3.1E-001
			4,4'-DDT	9.5E-007	--	4.8E-005	4.9E-005	4,4'-DDT	fetotoxic	1.6E-002	--	7.8E-001	8.0E-001
			Acenaphthene		--			Acenaphthene	eyes	2.1E-004	--	1.0E-002	1.1E-002
			Acetone		--			Acetone	fetotoxic	7.3E-003	--	4.7E-001	4.8E-001
			Aluminum		--			Aluminum	circulatory	9.3E-003	--	4.7E-001	4.8E-001
			Anthracene		--			Anthracene	GI tract	4.1E-006	--	2.1E-004	2.1E-004
			Antimony		--			Antimony	skin	2.3E-002	--	1.2E+002	1.2E+002
			Aroclor-1242	4.2E-005	--	2.1E-003	2.2E-003	Aroclor-1242	liver		--		
			Aroclor-1248	5.9E-005	--	3.0E-003	3.0E-003	Aroclor-1248	liver		--		
			Aroclor-1254	8.1E-005	--	4.6E-003	4.6E-003	Aroclor-1254	liver	5.6E+000	--	3.2E+002	3.2E+002
			Aroclor-1260	1.8E-005	--	8.9E-004	9.1E-004	Aroclor-1260	circulatory		--		
			Arsenic	2.1E-006	--	1.1E-004	1.2E-004	Arsenic	circulatory	1.3E-002	--	7.0E-001	7.2E-001
			Barium		--			Barium		2.6E-003	--	1.3E-001	1.3E-001
			Benzene	7.7E-005	--	4.3E-003	4.4E-003	Benzene	blood disorders	2.5E+000	--	1.4E+002	1.4E+002
			Benzoic Acid		--			Benzoic Acid	GI tract	3.7E-006	--	1.8E-004	1.9E-004
			Benzo(a)anthracene	5.0E-008	--	2.5E-006	2.6E-006	Benzo(a)anthracene			--		
			Benzo(a)pyrene	5.4E-007	--	3.2E-005	3.3E-005	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.1E-007	--	5.8E-006	5.9E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.1E-008	--	5.8E-007	5.9E-007	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	8.7E-004	--	4.4E+000	4.4E+000
			bis(2-Chloroethyl) ether	4.6E-006	--	2.3E-004	2.3E-004	bis(2-Chloroethyl) ether	reproductive		--		
			bis(2-Ethylhexyl)phthalate	1.5E-005	--	7.4E-004	7.5E-004	bis(2-Ethylhexyl)phthalate	liver	1.5E-001	--	7.4E+000	7.5E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	2.7E-003	--	1.4E-001	1.4E-001
			Cadmium		--			Cadmium	kidney	1.6E-002	--	3.2E+001	3.2E+001
			Chlorobenzene		--			Chlorobenzene	liver	5.6E-004	--	9.2E-002	9.2E-002
			Chloroform	5.2E-006	--	2.7E-004	2.8E-004	Chloroform	circulatory	2.4E-001	--	1.2E+001	1.3E+001
			Chromium 3+		--			Chromium 3+	liver	6.7E-005	--	8.4E-001	8.4E-001
			Chrysene	7.6E-010	--	9.4E-008	9.5E-008	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	1.4E-001	--	6.8E+000	6.9E+000
			Cobalt		--			Cobalt	heart	1.4E-004	--	6.9E-003	7.1E-003
			Copper		--			Copper	liver	1.5E-003	--	1.3E-001	1.3E-001
			Cyanide (total)		--			Cyanide (total)	liver	2.1E-004	--	2.1E-002	2.1E-002
			Dibenzofuran		--			Dibenzofuran	dec growth rate	1.2E-003	--	6.0E-002	6.1E-002

Table 6-1-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age: Adult

File: Area1RME.wk4\1.TT\_sum.f0\Wa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate		--			Diethylphthalate	low body wt	3.4E-005	--	1.7E-003	1.7E-003
			Dimethylphthalate		--			Dimethylphthalate	GI tract	6.7E-006	--	3.4E-004	3.5E-004
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	2.8E-003	--	1.5E-001	1.5E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		5.5E-004	--	2.8E-002	2.8E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	7.6E-002	--	4.1E+000	4.2E+000
			Fluoranthene		--			Fluoranthene	kidney	1.1E-004	--	5.4E-003	5.5E-003
			Fluorene		--			Fluorene	skeletal	2.7E-004	--	1.3E-002	1.4E-002
			Hexachlorobenzene	3.8E-007	--	2.4E-005	2.4E-005	Hexachlorobenzene	liver	8.3E-004	--	5.2E-002	5.3E-002
			Hexachlorobutadiene	2.5E-007	--	1.3E-005	1.3E-005	Hexachlorobutadiene	low body wt	4.5E-002	--	2.3E+000	2.3E+000
			Iron		--			Iron		2.5E-002	--	1.3E+000	1.3E+000
			Isophorone	1.1E-007	--	5.7E-006	5.8E-006	Isophorone	kidney	1.7E-003	--	8.4E-002	8.6E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	6.4E-002	--	3.2E+000	3.3E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	1.7E-006	--	1.6E-004	1.6E-004	Methylene Chloride	liver	1.1E-002	--	9.8E-001	9.9E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	3.1E-003	--	1.7E-001	1.8E-001
			Naphthalene		--			Naphthalene	circulatory	2.6E-002	--	1.3E+000	1.3E+000
			Nickel		--			Nickel	low body wt	4.4E-004	--	4.5E-001	4.5E-001
			ortho-xylene		--			ortho-xylene	fetotoxic	6.2E-004	--	3.5E-002	3.5E-002
			Pentachlorophenol	9.5E-007	--	4.8E-005	4.9E-005	Pentachlorophenol	liver	7.4E-004	--	3.7E-002	3.8E-002
			Phenol		--			Phenol	liver	3.5E-005	--	1.8E-003	1.8E-003
			Pyrene		--			Pyrene	liver	2.2E-004	--	1.1E-002	1.1E-002
			Selenium		--			Selenium	liver	9.7E-005	--	4.9E-003	5.0E-003
			Silver		--			Silver	skin	3.8E-004	--	9.0E-002	9.1E-002
			Styrene		--			Styrene	liver	5.1E-004	--	2.6E-002	2.6E-002
			Tetrachloroethene	1.7E-004	--	8.7E-003	8.9E-003	Tetrachloroethene	liver	9.4E-001	--	4.7E+001	4.8E+001
			Toluene		--			Toluene	liver	1.1E+000	--	5.7E+001	5.8E+001
			Trichloroethene	1.2E-005	--	6.4E-004	6.5E-004	Trichloroethene	liver	5.3E-001	--	2.7E+001	2.8E+001
			Vanadium		--			Vanadium	circulatory	1.9E-003	--	9.5E-002	9.7E-002
			Xylenes (total)		--			Xylenes (total)	fetotoxic	1.4E-002	--	7.9E-001	8.1E-001
			Zinc		--			Zinc	thyroid	8.6E-004	--	1.4E-001	1.5E-001
			(total)	5.0E-004	--	2.6E-002	2.7E-002	(total)		1.3E+001	--	8.5E+002	8.7E+002
	AIR	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	6.6E-003	--	6.6E-003
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	2.3E-001	--	2.3E-001
			1,1,2-Trichloroethane	--	2.4E-006	--	2.4E-006	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.9E-006	--	1.9E-006	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	1.1E-002	--	1.1E-002
			1,2-Dichloroethane	--	3.4E-005	--	3.4E-005	1,2-Dichloroethane	circulatory	--	7.4E-001	--	7.4E-001
			1,2-Dichloroethane (total)	--	--	--		1,2-Dichloroethane (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	5.2E-001	--	5.2E-001
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	1.6E-004	--	1.6E-004
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	4.2E-006	--	4.2E-006
			1,4-Dichlorobenzene	--	2.9E-007	--	2.9E-007	1,4-Dichlorobenzene	liver	--	1.6E-004	--	1.6E-004
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.2E-005	--	1.2E-005
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	--
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.1E-001	--	1.1E-001

Table 6-1-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age: Adult

File AreaIRME.wk4\TT\_sum\_RUWaiRME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			4-Methylphenol	--		--		4-Methylphenol				--	
			4,4'-DDD	--		--		4,4'-DDD				--	
			4,4'-DDT	--	5.1E-009	--	5.1E-009	4,4'-DDT	liver	--		--	
			Acenaphthene	--		--		Acenaphthene		--		--	
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	1.9E-007	--	1.9E-007	Aroclor-1242		--		--	
			Aroclor-1248	--	1.3E-007	--	1.3E-007	Aroclor-1248		--		--	
			Aroclor-1254	--	2.2E-007	--	2.2E-007	Aroclor-1254		--		--	
			Aroclor-1260	--	1.4E-007	--	1.4E-007	Aroclor-1260		--		--	
			Arsenic	--	2.3E-007	--	2.3E-007	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--		--	
			Benzene	--	1.2E-004	--	1.2E-004	Benzene	blood disorders	--	1.7E-002	--	1.7E-002
			Benzoic Acid	--		--		Benzoic Acid		--	6.8E+000	--	6.8E+000
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	2.0E-010	--	2.0E-010	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Beryllium	--	2.6E-008	--	2.6E-008	Beryllium	respiratory	--	1.5E-003	--	1.5E-003
			bis(2-Chloroethyl) ether	--	1.3E-005	--	1.3E-005	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	1.4E-008	--	1.4E-008	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	2.9E-007	--	2.9E-007	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	1.2E-006	--	1.2E-006
			Chlorobenzene	--		--		Chlorobenzene	liver	--	2.9E-002	--	2.9E-002
			Chloroform	--	3.1E-004	--	3.1E-004	Chloroform	liver	--	1.2E+002	--	1.2E+002
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	3.6E-006	--	3.6E-006	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dieldrin	--	1.2E-008	--	1.2E-008	Dieldrin		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	3.4E-002	--	3.4E-002
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			gamma-Chlordane	--	1.3E-009	--	1.3E-009	gamma-Chlordane		--	5.3E-005	--	5.3E-005
			Hexachlorobenzene	--	3.6E-011	--	3.6E-011	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.5E-009	--	1.5E-009	Hexachlorobutadiene	kidney	--		--	

Table 6-1-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age: Adult

File: Area1RME.wk4\TT\_sum\_RAWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	4.1E-001	--	4.1E-001
			Mercury	--		--		Mercury	CNS	--	3.3E-004	--	3.3E-004
			Methylene Chloride	--	8.7E-006	--	8.7E-006	Methylene Chloride	respiratory	--	1.7E-002	--	1.7E-002
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	2.1E-001	--	2.1E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Phthalic anhydride	--		--		Phthalic anhydride		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	2.1E-003	--	2.1E-003
			Tetrachloroethene	--	9.2E-006	--	9.2E-006	Tetrachloroethene	liver	--	9.2E-002	--	9.2E-002
			Toluene	--		--		Toluene	CNS	--	2.1E-001	--	2.1E-001
			Trichloroethene	--	2.1E-005	--	2.1E-005	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		5.2E-004		5.2E-004	(total)			1.3E+002		1.3E+002
			Total Risk Across Subsurface Soil				2.7E-002	Subsurface Soil					1.0E+003
			Total Risk Across All Media and All Exposure Routes				Reserved						

Total Kidney HI:	4.2E+001
Total Skin HI:	1.2E+002
Total Thyroid HI:	1.5E-001
Total Liver HI:	6.6E+002
Total Circulatory System HI:	2.3E+001
Total CNS HI:	3.4E-001
Total Fetotoxic HI:	2.4E+000
Total GI Tract HI:	9.4E-001
Total Respiratory HI:	7.7E-001
Total Eyes HI:	1.1E-002
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.4E-001
Total Adrenal HI:	0.0E+000
Total Heart HI:	7.1E-003
Total Skeletal System HI:	1.4E-002
Total Thyroid HI:	1.5E-001
Total Blood Disorders HI:	1.5E+002

Table 6-1-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age: Adult

File: Area1CT.wk4\TT\_sum\_R\WVatCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	3.1E-004	--	3.1E-003	3.5E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	1.5E+000	--	1.5E+001	1.7E+001
			1,1,2-Trichloroethane	6.5E-010	--	8.0E-009	8.6E-009	1,1,2-Trichloroethane	blood disorders	2.9E-003	--	3.6E-002	3.9E-002
			1,1,2,2-Tetrachloroethane	1.1E-009	--	1.6E-008	1.7E-008	1,1,2,2-Tetrachloroethane	liver	9.3E-005	--	1.3E-003	1.4E-003
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	4.4E-004	--	4.4E-003	4.9E-003
			1,2-Dichloroethane	5.1E-009	--	5.1E-008	5.6E-008	1,2-Dichloroethane	fetotoxic	1.9E-003	--	1.9E-002	2.1E-002
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	kidney	3.8E-002	--	3.8E-001	4.2E-001
			1,2-Dichloropropane	2.1E-009	--	2.1E-008	2.3E-008	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	6.1E-004	--	6.1E-003	6.8E-003
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	circulatory	4.2E-005	--	4.2E-004	4.6E-004
			1,4-Dichlorobenzene	1.7E-010	--	1.7E-009	1.9E-009	1,4-Dichlorobenzene	GI tract	2.5E-004	--	2.5E-003	2.7E-003
			2-Butanone	--	--	--	--	2-Butanone	liver	1.3E-003	--	1.3E-002	1.5E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	2.3E-002	--	2.3E-001	2.5E-001
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	3.5E-004	--	3.5E-003	3.8E-003
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	kidney	2.0E-003	--	2.0E-002	2.1E-002
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	8.6E-004	--	8.6E-003	9.4E-003
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	2.7E-002	--	2.7E-001	2.9E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	5.0E-003	--	7.8E-002	8.3E-002
			4,4'-DDT	3.3E-009	--	3.3E-008	3.6E-008	4,4'-DDT	fetotoxic	2.0E-002	--	2.0E-001	2.2E-001
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	2.6E-004	--	2.6E-003	2.9E-003
			Acetone	--	--	--	--	Acetone	fetotoxic	9.3E-003	--	1.2E-001	1.3E-001
			Aluminum	--	--	--	--	Aluminum	circulatory	1.2E-002	--	1.2E-001	1.3E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	5.2E-006	--	5.2E-005	5.8E-005
			Antimony	--	--	--	--	Antimony	skin	3.0E-002	--	3.0E+001	3.0E+001
			Aroclor-1242	1.5E-007	--	1.5E-006	1.6E-006	Aroclor-1242	liver	--	--	--	--
			Aroclor-1248	2.0E-007	--	2.0E-006	2.2E-006	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	2.8E-007	--	3.1E-006	3.4E-006	Aroclor-1254	liver	7.1E+000	--	8.0E+001	8.7E+001
			Aroclor-1260	6.2E-008	--	6.2E-007	6.8E-007	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	7.4E-009	--	7.8E-008	8.5E-008	Arsenic	circulatory	1.7E-002	--	1.8E-001	1.9E-001
			Barium	--	--	--	--	Barium	--	3.3E-003	--	3.3E-002	3.6E-002
			Benzene	2.7E-007	--	3.0E-006	3.2E-006	Benzene	blood disorders	3.1E+000	--	3.5E+001	3.8E+001
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	4.6E-006	--	4.6E-005	5.1E-005
			Benzo(a)anthracene	1.7E-010	--	1.7E-009	1.9E-009	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	1.9E-009	--	2.2E-008	2.4E-008	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	4.0E-010	--	4.0E-009	4.4E-009	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	4.0E-011	--	4.0E-010	4.4E-010	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	1.1E-003	--	1.1E+000	1.1E+000
			bis(2-Chloroethyl) ether	1.6E-008	--	1.6E-007	1.7E-007	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	5.1E-008	--	5.1E-007	5.6E-007	bis(2-Ethylhexyl)phthalate	liver	1.9E-001	--	1.9E+000	2.0E+000
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	3.4E-003	--	3.4E-002	3.8E-002
			Cadmium	--	--	--	--	Cadmium	kidney	2.0E-002	--	8.1E+000	8.1E+000
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	7.1E-004	--	2.3E-002	2.4E-002
			Chloroform	1.8E-008	--	1.9E-007	2.1E-007	Chloroform	circulatory	3.0E-001	--	3.1E+000	3.4E+000
			Chromium 3+	--	--	--	--	Chromium 3+	liver	8.4E-005	--	2.1E-001	2.1E-001
			Chrysene	2.7E-012	--	6.5E-011	6.7E-011	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	1.7E-001	--	1.7E+000	1.9E+000
			Cobalt	--	--	--	--	Cobalt	heart	1.7E-004	--	1.7E-003	1.9E-003
			Copper	--	--	--	--	Copper	liver	1.9E-003	--	3.2E-002	3.4E-002
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	2.7E-004	--	5.3E-003	5.6E-003
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	1.5E-003	--	1.5E-002	1.7E-002
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	4.3E-005	--	4.3E-004	4.7E-004
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	8.5E-006	--	8.5E-005	9.4E-005
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	3.6E-003	--	3.7E-002	4.0E-002
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	7.0E-004	--	7.0E-003	7.7E-003
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	9.6E-002	--	1.0E+000	1.1E+000
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	1.4E-004	--	1.4E-003	1.5E-003



Table 6-1-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age Adult

File: Area1CT, wk41, TT, sum, IUWa1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Fluorene		--			Fluorene	skeletal	3.4E-004	--	3.4E-003	3.7E-003
			Hexachlorobenzene	1.3E-009	--	1.6E-008	1.8E-008	Hexachlorobenzene	liver	1.1E-003	--	1.3E-002	1.4E-002
			Hexachlorobutadiene	8.7E-010	--	8.7E-009	9.5E-009	Hexachlorobutadiene	low body wt	5.7E-002	--	5.7E-001	6.3E-001
			Iron		--			Iron		3.2E-002	--	3.2E-001	3.5E-001
			Isophorone	3.9E-010	--	3.9E-009	4.3E-009	Isophorone	kidney	2.1E-003	--	2.1E-002	2.3E-002
			Lead		--			Lead	CNS	--	--		
			Manganese		--			Manganese	kidney	8.2E-002	--	8.2E-001	9.0E-001
			Mercury		--			Mercury	low body wt	--	--		
			Methylene Chloride	6.0E-009	--	1.1E-007	1.1E-007	Methylene Chloride	liver	1.4E-002	--	2.5E-001	2.6E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	3.9E-003	--	4.4E-002	4.8E-002
			Naphthalene		--			Naphthalene	circulatory	3.3E-002	--	3.3E-001	3.6E-001
			Nickel		--			Nickel	low body wt	5.6E-004	--	1.1E-001	1.1E-001
			ortho-xylene		--			ortho-xylene	fetotoxic	7.9E-004	--	8.7E-003	9.5E-003
			Pentachlorophenol	3.3E-009	--	3.3E-008	3.6E-008	Pentachlorophenol	liver	9.4E-004	--	9.4E-003	1.0E-002
			Phenol		--			Phenol	liver	4.5E-005	--	4.5E-004	4.9E-004
			Pyrene		--			Pyrene	liver	2.8E-004	--	2.8E-003	3.1E-003
			Selenium		--			Selenium	liver	1.2E-004	--	1.2E-003	1.4E-003
			Silver		--			Silver	skin	4.8E-004	--	2.3E-002	2.3E-002
			Styrene		--			Styrene	liver	6.4E-004	--	6.4E-003	7.1E-003
			Tetrachloroethene	6.0E-007	--	6.0E-006	6.6E-006	Tetrachloroethene	liver	1.2E+000	--	1.2E+001	1.3E+001
			Toluene		--			Toluene	liver	1.4E+000	--	1.4E+001	1.6E+001
			Trichloroethene	4.3E-008	--	4.4E-007	4.8E-007	Trichloroethene	liver	6.7E-001	--	6.8E+000	7.5E+000
			Vanadium		--			Vanadium	circulatory	2.4E-003	--	2.4E-002	2.6E-002
			Xylenes (total)		--			Xylenes (total)	fetotoxic	1.8E-002	--	2.0E-001	2.2E-001
			Zinc		--			Zinc	thyroid	1.1E-003	--	3.6E-002	3.7E-002
			(total)	1.7E-006		1.8E-005	2.0E-005	(total)		1.6E+001		2.1E+002	2.3E+002
	AIR	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	9.6E-003	--	9.6E-003
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	3.3E-001	--	3.3E-001
			1,1,2-Trichloroethane	--	9.5E-009	--	9.5E-009	1,1,2-Trichloroethane	liver	--	--	--	
			1,1,2,2-Tetrachloroethane	--	7.4E-009	--	7.4E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	1.5E-002	--	1.5E-002
			1,2-Dichloroethane	--	1.3E-007	--	1.3E-007	1,2-Dichloroethane	circulatory	--	1.1E+000	--	1.1E+000
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	7.6E-001	--	7.6E-001
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	2.4E-004	--	2.4E-004
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	6.1E-006	--	6.1E-006
			1,4-Dichlorobenzene	--	1.2E-009	--	1.2E-009	1,4-Dichlorobenzene	liver	--	2.4E-004	--	2.4E-004
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.8E-005	--	1.8E-005
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.6E-001	--	1.6E-001
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	
			4,4'-DDT	--	2.0E-011	--	2.0E-011	4,4'-DDT	liver	--	--	--	
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	
			Acenaphthylene	--	--	--		Acenaphthylene		--	--	--	
			Acetone	--	--	--		Acetone		--	--	--	
			Anthracene	--	--	--		Anthracene		--	--	--	
			Antimony	--	--	--		Antimony		--	--	--	
			Aroclor-1242	--	7.6E-010	--	7.6E-010	Aroclor-1242		--	--	--	
			Aroclor-1248	--	5.3E-010	--	5.3E-010	Aroclor-1248		--	--	--	
			Aroclor-1254	--	8.9E-010	--	8.9E-010	Aroclor-1254		--	--	--	
			Aroclor-1260	--	5.5E-010	--	5E-010	Aroclor-1260		--	--	--	

Table 6-1-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age: Adult

File: Area1CI.wk4\IT\_sum (UW)at1CI

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Arsenic	--	9.4E-010	--	9.4E-010	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	2.5E-002	--	2.5E-002
			Benzene	--	4.8E-007	--	4.8E-007	Benzene	blood disorders	--	9.9E+000	--	9.9E+000
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	7.9E-013	--	7.9E-013	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	1.0E-010	--	1.0E-010	Beryllium	respiratory	--	2.2E-003	--	2.2E-003
			bis(2-Chloroethyl) ether	--	5.2E-008	--	5.2E-008	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	5.8E-011	--	5.8E-011	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	1.2E-009	--	1.2E-009	Cadmium	--	--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	--	--	1.7E-006	--	1.7E-006
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	4.3E-002	--	4.3E-002
			Chloroform	--	1.2E-006	--	1.2E-006	Chloroform	liver	--	1.8E+002	--	1.8E+002
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	1.4E-008	--	1.4E-008	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Dieldrin	--	4.9E-011	--	4.9E-011	Dieldrin	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Endosulfan I	--	--	--	--	Endosulfan I	--	--	--	--	--
			Endrin	--	--	--	--	Endrin	--	--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	5.0E-002	--	5.0E-002
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			gamma-Chlordane	--	5.3E-012	--	5.3E-012	gamma-Chlordane	--	--	7.8E-005	--	7.8E-005
			Hexachlorobenzene	--	1.4E-013	--	1.4E-013	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	5.9E-012	--	5.9E-012	Hexachlorobutadiene	kidney	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Isophorone	--	--	--	--	Isophorone	--	--	--	--	--
			Lead	--	--	--	--	Lead	--	--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	6.0E-001	--	6.0E-001
			Mercury	--	--	--	--	Mercury	CNS	--	4.8E-004	--	4.8E-004
			Methylene Chloride	--	3.5E-008	--	3.5E-008	Methylene Chloride	respiratory	--	2.5E-002	--	2.5E-002
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	3.0E-001	--	3.0E-001
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--
			Silver	--	--	--	--	Silver	--	--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	3.1E-003	--	3.1E-003

Table 6-1-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Current/Future  
Receptor Population Utility Worker  
Receptor Age Adult

File: Area1CJT.wk4\1TT sum IUWa1CJT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Tetrachloroethene	--	3.7E-008	--	3.7E-008	Tetrachloroethene	liver	--	1.3E-001	--	1.3E-001
			Toluene	--	--	--	--	Toluene	CNS	--	3.1E-001	--	3.1E-001
			Trichloroethene	--	8.4E-008	--	8.4E-008	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	--	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc	--	--	--	--	--
			(total)		2.1E-006		2.1E-006	(total)			2.0E+002		2.0E+002
Total Hazard Index Across Subsurface Soil							2.2E-005	Total Risk Across Subsurface Soil					4.3E+002
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	1.1E+001
Total Skin HI:	3.0E+001
Total Thyroid HI:	3.7E-002
Total Liver HI:	3.3E+002
Total Circulatory System HI:	7.4E+000
Total CNS HI:	4.8E-001
Total Fetotoxic HI:	6.6E-001
Total GI Tract HI:	2.5E-001
Total Respiratory HI:	7.6E-001
Total Eyes HI:	2.9E-003
Total Reproductive HI:	0.0E+000
Total Mammary HI:	3.8E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.9E-003
Total Skeletal System HI:	3.7E-003
Total Thyroid HI:	3.7E-002
Total Blood Disorder HI:	4.8E+001

Table 6-1-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: UT11RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Sediment	Sediment	Sediment Area 1	Aluminum					Aluminum	circulatory system	5.5E-003		2.8E-003	8.3E-003		
			Aroclor-1248	3.7E-006		1.9E-005	2.2E-005	Aroclor-1248	liver						
			Aroclor-1254	1.4E-005		1.1E-004	1.2E-004	Aroclor-1254	liver	9.6E-001		7.5E+000	8.5E+000		
			Arsenic	9.1E-007		1.4E-006	2.3E-006	Arsenic	circulatory system	5.6E-003		8.8E-003	1.4E-002		
			Barium					Barium	NA	1.1E-003		5.6E-004	1.7E-003		
			Beryllium					Beryllium	kidney	1.8E-004		9.1E-003	9.3E-003		
			bis(2-Ethylhexyl)phthalate	7.3E-008		3.7E-007	4.4E-007	bis(2-Ethylhexyl)phthalate	liver	7.3E-004		3.7E-003	4.4E-003		
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	9.0E-007		4.5E-006	5.4E-006		
			Cadmium					Cadmium	kidney	1.5E-003		3.0E-001	3.0E-001		
			Chloroform	4.9E-012		2.6E-011	3.1E-011	Chloroform	circulatory system	2.3E-007		1.2E-006	1.4E-006		
			Chromium (total)					Chromium (total)		7.9E-003		4.0E-002	4.8E-002		
			Copper					Copper	liver	6.8E-004		5.7E-004	1.3E-003		
			Di-n-butylphthalate					Di-n-butylphthalate	liver	1.9E-006		9.9E-006	1.2E-005		
			Iron					Iron		1.8E-002		8.9E-003	2.6E-002		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	1.2E-002			1.2E-002		
			Mercury					Mercury	low body weight						
			Phenol					Phenol	liver	3.6E-007		1.8E-006	2.2E-006		
			Toluene					Toluene	liver	1.7E-008		8.5E-008	1.0E-007		
			Vanadium					Vanadium	circulatory system	1.0E-003		5.0E-004	1.5E-003		
			Zinc					Zinc	thyroid	4.3E-004		7.2E-004	1.1E-003		
(Total)				1.8E-005		1.3E-004	1.5E-004	(Total)				1.0E+000		7.9E+000	8.9E+000
Total Risk Across Sediments							1.5E-004	Total Hazard Index Across All Exposure Routes							8.9E+000

Total Circulatory System HI =	2.4E-002
Total Thyroid HI =	1.1E-003
Total Kidney HI =	3.2E-001
Total Liver HI =	8.5E+000

Table 6-1-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: UT11CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Sediment	Sediment	Sediment Area 1	Aluminum					Aluminum	circulatory system	2.1E-003		4.2E-004	2.6E-003		
			Aroclor-1248	2.9E-007		5.6E-007	8.5E-007	Aroclor-1248	liver						
			Aroclor-1254	1.1E-006		3.3E-006	4.3E-006	Aroclor-1254	liver	3.7E-001		1.1E+000	1.5E+000		
			Arsenic	7.0E-008		4.4E-008	1.1E-007	Arsenic	circulatory system	2.2E-003		1.3E-003	3.5E-003		
			Barium					Barium	NA	4.3E-004		8.5E-005	5.2E-004		
			Beryllium					Beryllium	kidney	7.0E-005		1.4E-003	1.4E-003		
			bis(2-Ethylhexyl)phthalate	5.7E-009		1.1E-008	1.7E-008	bis(2-Ethylhexyl)phthalate	liver	2.8E-004		5.6E-004	8.4E-004		
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	3.5E-007		6.9E-007	1.0E-006		
			Cadmium					Cadmium	kidney	5.7E-004		4.5E-002	4.5E-002		
			Chloroform	3.8E-013		7.8E-013	1.2E-012	Chloroform	circulatory system	8.8E-008		1.8E-007	2.7E-007		
			Chromium (total)					Chromium (total)		3.1E-003		6.0E-003	9.1E-003		
			Copper					Copper	liver	2.7E-004		8.7E-005	3.5E-004		
			Di-n-butylphthalate					Di-n-butylphthalate	liver	7.5E-007		1.5E-006	2.2E-006		
			Iron					Iron		6.9E-003		1.3E-003	8.2E-003		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	4.7E-003			4.7E-003		
			Mercury					Mercury	low body weight						
			Phenol					Phenol	liver	1.4E-007		2.7E-007	4.1E-007		
			Toluene					Toluene	liver	6.6E-009		1.3E-008	1.9E-008		
			Vanadium					Vanadium	circulatory system	3.9E-004		7.6E-005	4.6E-004		
			Zinc					Zinc	thyroid	1.7E-004		1.1E-004	2.8E-004		
(Total)				1.4E-006		3.9E-006	5.3E-006	(Total)		3.9E-001		1.2E+000	1.6E+000		
Total Risk Across Sediments							5.3E-006	Total Hazard Index Across All Exposure Routes							1.6E+000

Total Circulatory System HI = 6.5E-003  
Total Thyroid HI = 2.8E-004  
Total Kidney HI = 5.1E-002  
Total Liver HI = 1.5E+000

TABLE 6-1-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\lacs\rsk\lacs\UGW1\FWRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Groundwater Area 1	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system			9.10E-003	9.10E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS			1.31E-001	1.31E-001
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney			6.10E-002	6.10E-002
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	circulatory system			3.11E-002	3.11E-002
			1,4-Dichlorobenzene			5.51E-008	5.51E-008	1,4-Dichlorobenzene	GI tract			7.82E-002	7.82E-002
			2,2'-oxybis(1-Chloropropane)			3.98E-007	3.98E-007	2,2'-oxybis(1-Chloropropane)	low body wt			1.45E-001	1.45E-001
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized			3.32E-001	3.32E-001
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract			6.11E-001	6.11E-001
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver			1.03E-002	1.03E-002
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver			9.78E-004	9.78E-004
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory			9.53E-001	9.53E-001
			Aluminum					Aluminum	circulatory system			1.02E-003	1.02E-003
			Ammonia					Ammonia	kidney				
			Arochlor-1248			6.23E-005	6.23E-005	Arochlor-1248	liver				
			Arsenic			3.20E-007	3.20E-007	Arsenic	circulatory system			7.28E-001	7.28E-001
			Barium					Barium	NA			4.10E-002	4.10E-002
			Benzene			2.53E-004	2.53E-004	Benzene	blood disorders			2.98E+003	2.98E+003
			Benzoic Acid					Benzoic Acid	GI tract			9.62E-005	9.62E-005
			bis(2-Chloroethyl)Ether			1.53E-006	1.53E-006	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			8.02E-008	8.02E-008	bis(2-Ethylhexyl)Phthalate	liver			2.93E-001	2.93E-001
			Cadmium (water)					Cadmium (water)	kidney			4.50E-001	4.50E-001
			Chlorobenzene					Chlorobenzene	liver			2.44E+000	2.44E+000
			Chloroethane			1.65E-007	1.65E-007	Chloroethane	liver			1.45E-001	1.45E-001
			Chloromethane			1.38E-008	1.38E-008	Chloromethane	kidney				

TABLE 6-1-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\UGW1\FWRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Cyanide					Cyanide	liver			3.63E-003	3.63E-003
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA			3.81E+000	3.81E+000
			Diethylphthalate					Diethylphthalate	low body wt			2.94E-004	2.94E-004
			Ethylbenzene					Ethylbenzene	liver			3.21E+000	3.21E+000
			Iron					Iron				6.17E-001	6.17E-001
			Manganese (nonfood)					Manganese (nonfood)	kidney			7.72E-001	7.72E-001
			Methylene Chloride			2.34E-010	2.34E-010	Methylene Chloride	liver			5.30E-004	5.30E-004
			Naphthalene					Naphthalene	circulatory system			8.99E-001	8.99E-001
			Nickel					Nickel	low body wt			1.93E-002	1.93E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic				
			Phenol					Phenol	liver			8.63E-003	8.63E-003
			Selenium					Selenium	liver			4.50E-003	4.50E-003
			Thallium					Thallium	NA			1.87E-001	1.87E-001
			Toluene					Toluene	liver			1.95E+000	1.95E+000
			Vanadium					Vanadium	circulatory system			1.05E-002	1.05E-002
			Vinyl Chloride			8.28E-007	8.28E-007	Vinyl Chloride	liver				
			Xylene (mixed)					Xylene (mixed)	fetotoxic			4.55E-001	4.55E-001
			Zinc					Zinc	thyroid			1.23E-002	1.23E-002
			(Total)			3.19E-004	3.19E-004	(Total)				3.00E+003	3.00E+003
	Air	Vapors	1,1-Dichloroethane					1,1-Dichloroethane	kidney		4.98E-005		4.98E-005
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	low body weight		5.31E-003		5.31E-003
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)					
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	respiratory system				
			1,4-Dichlorobenzene		6.08E-011		6.08E-011	1,4-Dichlorobenzene	liver		1.23E-005		1.23E-005
			2,2'-oxybis(1-Chloropropane)		6.15E-009		6.15E-009	2,2'-oxybis(1-Chloropropane)	liver				
			2,4-Dimethylphenol					2,4-Dimethylphenol					
			2-Methylnaphthalene					2-Methylnaphthalene					
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	NA				
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	CNS				
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	NA				
			Aluminum					Aluminum	respiratory system				

TABLE 6-1-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acsr\skt\bls\UGW1FWRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Ammonia					Ammonia	respiratory tract		4.90E-003		4.90E-003
			Arochlor-1248					Arochlor-1248	NA				
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzene		3.71E-006		3.71E-006	Benzene	blood disorders		7.69E+001		7.69E+001
			Benzoic Acid					Benzoic Acid					
			bis(2-Chloroethyl)Ether		4.12E-008		4.12E-008	bis(2-Chloroethyl)Ether	liver				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Cadmium (water)					Cadmium (water)	respiratory tract				
			Chlorobenzene					Chlorobenzene	liver				
			Chloroethane					Chloroethane	fetotoxic		9.44E-004		9.44E-004
			Chloromethane					Chloromethane	kidney				
			Cyanide					Cyanide					
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate					
			Diethylphthalate					Diethylphthalate					
			Ethylbenzene					Ethylbenzene	respiratory tract		3.03E-003		3.03E-003
			Iron					Iron					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		1.39E-010		1.39E-010	Methylene Chloride	respiratory tract		1.00E-004		1.00E-004
			Naphthalene					Naphthalene	circulatory system		3.08E-003		3.08E-003
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					



TABLE 6-1-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\lacs\sktbls\UGW1FWRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene					Toluene	CNS		2.43E-002		2.43E-002
			Vanadium					Vanadium					
			Vinyl Chloride		3.89E-010		3.89E-010	Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
			(Total)		3.76E-006		3.76E-006	(Total)			7.69E+001		7.69E+001
Total Risk Across Groundwater							3.2E-004	Total Risk Across Groundwater					3.1E+003
Total Risk Across All Media and All Exposure Routes							3.1E+003						

Total Circulatory System HI =	1.7E+000
Total Blood Disorders HI =	3.1E+003
Total Liver HI =	8.1E+000
Total Kidney HI =	1.3E+000
Total Fetotoxic HI =	4.6E-001
Total Skin HI =	0.0E+000
Total GI Tract HI =	6.9E-001
Total Thyroid HI =	1.2E-002
Total Respiratory Tract HI =	9.6E-001
Total CNS HI =	1.6E-001

TABLE 6-1-6  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\lacs\rsktbls\UGW1FWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Groundwater Area 1	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system			6.87E-003	6.87E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS			9.91E-002	9.91E-002
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney			4.60E-002	4.60E-002
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	circulatory system			2.35E-002	2.35E-002
			1,4-Dichlorobenzene			8.32E-009	8.32E-009	1,4-Dichlorobenzene	GI tract			5.90E-002	5.90E-002
			2,2'-oxybis(1-Chloropropane)			6.02E-008	6.02E-008	2,2'-oxybis(1-Chloropropane)	low body wt			1.10E-001	1.10E-001
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized			2.51E-001	2.51E-001
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract			4.62E-001	4.62E-001
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver			7.79E-003	7.79E-003
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver			7.38E-004	7.38E-004
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory			7.19E-001	7.19E-001
			Aluminum					Aluminum	circulatory system			7.68E-004	7.68E-004
			Ammonia					Ammonia	kidney				
			Arochlor-1248			9.41E-006	9.41E-006	Arochlor-1248	liver				
			Arsenic			4.84E-008	4.84E-008	Arsenic	circulatory system			5.50E-001	5.50E-001
			Barium					Barium	NA			3.10E-002	3.10E-002
			Benzene			3.83E-005	3.83E-005	Benzene	blood disorders			2.25E+003	2.25E+003
			Benzoic Acid					Benzoic Acid	GI tract			7.27E-005	7.27E-005
			bis(2-Chloroethyl)Ether			2.30E-007	2.30E-007	bis(2-Chloroethyl)Ether	reproductive				0.00E+000
			bis(2-Ethylhexyl)Phthalate			1.21E-008	1.21E-008	bis(2-Ethylhexyl)Phthalate	liver			2.21E-001	2.21E-001
			Cadmium (water)					Cadmium (water)	kidney			3.40E-001	3.40E-001
			Chlorobenzene					Chlorobenzene	liver			1.84E+000	1.84E+000
			Chloroethane			2.49E-008	2.49E-008	Chloroethane	liver			1.10E-001	1.10E-001
			Chloromethane			2.08E-009	2.08E-009	Chloromethane	kidney				

TABLE 6-1-6  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acsr\sktbls\UGW1FWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Cyanide					Cyanide	liver			2.74E-003	2.74E-003
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA			2.88E+000	2.88E+000
			Diethylphthalate					Diethylphthalate	low body wt			2.22E-004	2.22E-004
			Ethylbenzene					Ethylbenzene	liver			2.42E+000	2.42E+000
			Iron					Iron				4.66E-001	4.66E-001
			Manganese (nonfood)					Manganese (nonfood)	kidney			5.83E-001	5.83E-001
			Methylene Chloride			3.53E-011	3.53E-011	Methylene Chloride	liver			4.01E-004	4.01E-004
			Naphthalene					Naphthalene	circulatory system			6.79E-001	6.79E-001
			Nickel					Nickel	low body wt			1.45E-002	1.45E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic				
			Phenol					Phenol	liver			6.52E-003	6.52E-003
			Selenium					Selenium	liver			3.40E-003	3.40E-003
			Thallium					Thallium	NA			1.41E-001	1.41E-001
			Toluene					Toluene	liver			1.47E+000	1.47E+000
			Vanadium					Vanadium	circulatory system			7.92E-003	7.92E-003
			Vinyl Chloride			1.25E-007	1.25E-007	Vinyl Chloride	liver				
			Xylene (mixed)					Xylene (mixed)	fetotoxic			3.44E-001	3.44E-001
			Zinc					Zinc	thyroid			9.33E-003	9.33E-003
			(Total)			4.82E-005	4.82E-005	(Total)				2.26E+003	2.26E+003
	Air	Vapors	1,1-Dichloroethane					1,1-Dichloroethane	kidney		4.36E-005		4.36E-005
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	low body weight		4.65E-003		4.65E-003
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)					
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	respiratory system				
			1,4-Dichlorobenzene		1.07E-011		1.07E-011	1,4-Dichlorobenzene	liver		1.08E-005		1.08E-005
			2,2'-oxybis(1-Chloropropane)		1.08E-009		1.08E-009	2,2'-oxybis(1-Chloropropane)	liver				
			2,4-Dimethylphenol					2,4-Dimethylphenol					
			2-Methylnaphthalene					2-Methylnaphthalene					
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	NA				

TABLE 6-1-6  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acsvrskibis\UGW1\FWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	CNS				
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	NA				
			Aluminum					Aluminum	respiratory system				
			Ammonia					Ammonia	respiratory tract		4.30E-003		4.30E-003
			Arochlor-1248					Arochlor-1248	NA				
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzene		6.50E-007		6.50E-007	Benzene	blood disorders		6.74E+001		6.74E+001
			Benzoic Acid					Benzoic Acid					
			bis(2-Chloroethyl)Ether		7.22E-009		7.22E-009	bis(2-Chloroethyl)Ether	liver				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Cadmium (water)					Cadmium (water)	respiratory tract				
			Chlorobenzene					Chlorobenzene	liver				
			Chloroethane					Chloroethane	fetotoxic		8.27E-004		8.27E-004
			Chloromethane					Chloromethane	kidney				
			Cyanide					Cyanide					
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate					
			Diethylphthalate					Diethylphthalate					
			Ethylbenzene					Ethylbenzene	respiratory tract		2.65E-003		2.65E-003
			Iron					Iron					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		2.44E-011		2.44E-011	Methylene Chloride	respiratory tract		8.79E-005		8.79E-005
			Naphthalene					Naphthalene	circulatory system		2.70E-003		2.70E-003
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					

TABLE 6-1-6  
OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current / Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\UGW1FWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene					Toluene	CNS		2.13E-002		2.13E-002
			Vanadium					Vanadium					
			Vinyl Chloride		6.82E-011		6.82E-011	Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
			(Total)		6.58E-007		6.58E-007	(Total)			6.74E+001		6.74E+001
Total Risk Across Groundwater								Total Risk Across Groundwater					
Total Risk Across All Media and All Exposure Routes								Total Risk Across All Media and All Exposure Routes					

Total Circulatory System HI =	1.3E+000
Total Blood Disorders HI =	2.3E+003
Total Liver HI =	6.1E+000
Total Kidney HI =	9.7E-001
Total Fetotoxic HI =	3.4E-001
Total Skin HI =	0.0E+000
Total GI Tract HI =	5.2E-001
Total Thyroid HI =	9.3E-003
Total Respiratory Tract HI =	7.3E-001
Total CNS HI =	1.2E-001

Table 6-1-7  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Current  
Receptor Population Routine Worker  
Receptor Age Adult

File: Area1RME.wk41 TT\_sum\_cWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 1, Surface Soil (0' to 2')	1,1,2-Trichloroethane	2.3E-010	--	1.9E-008	1.9E-008	1,1,2-Trichloroethane	blood disorders	2.8E-006	--	2.3E-004	2.3E-004
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	kidney	1.1E-006	--	7.6E-005	7.7E-005
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.5E-005	--	9.6E-004	9.8E-004
			3,3'-Dichlorobenzidine	2.9E-008	--	1.9E-006	1.9E-006	3,3'-Dichlorobenzidine	liver	--	--	--	--
			Aluminum	--	--	--	--	Aluminum	circulatory	1.4E-002	--	9.6E-001	9.7E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	2.5E-007	--	1.7E-005	1.7E-005
			Antimony	--	--	--	--	Antimony	skin	2.0E-003	--	1.3E+001	1.3E+001
			Aroclor-1242	3.1E-007	--	2.0E-005	2.1E-005	Aroclor-1242	liver	--	--	--	--
			Aroclor-1248	4.1E-007	--	2.7E-005	2.8E-005	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	3.4E-006	--	2.5E-004	2.5E-004	Aroclor-1254	liver	2.4E-001	--	1.8E+001	1.8E+001
			Aroclor-1260	5.0E-007	--	3.3E-005	3.3E-005	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	1.3E-006	--	8.9E-005	9.0E-005	Arsenic	circulatory	7.9E-003	--	5.5E-001	5.6E-001
			Barium	--	--	--	--	Barium	--	2.3E-003	--	1.5E-001	1.5E-001
			Benzo(a)anthracene	1.3E-008	--	8.7E-007	8.9E-007	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	1.8E-007	--	1.4E-005	1.5E-005	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	1.9E-008	--	1.3E-006	1.3E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	1.6E-009	--	1.1E-007	1.1E-007	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	2.5E-003	--	1.6E+001	1.6E+001
			bis(2-Ethylhexyl)phthalate	4.2E-008	--	2.8E-006	2.8E-006	bis(2-Ethylhexyl)phthalate	liver	4.2E-004	--	2.8E-002	2.8E-002
			Cadmium	--	--	--	--	Cadmium	kidney	1.4E-003	--	3.8E+000	3.8E+000
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	adrenal	1.7E-008	--	1.1E-006	1.2E-006
			Nickel	--	--	--	--	Nickel	low body wt	3.3E-004	--	4.4E-001	4.4E-001
			Selenium	--	--	--	--	Selenium	liver	7.9E-005	--	5.2E-003	5.3E-003
			Silver	--	--	--	--	Silver	skin	5.0E-005	--	1.6E-002	1.6E-002
			Tetrachloroethane	1.4E-008	--	9.5E-007	9.6E-007	Tetrachloroethane	liver	7.7E-005	--	5.1E-003	5.2E-003
			Toluene	--	--	--	--	Toluene	liver	7.6E-007	--	5.1E-005	5.1E-005
			Trichloroethane	4.8E-010	--	3.3E-008	3.3E-008	Trichloroethane	liver	2.0E-005	--	1.4E-003	1.4E-003
			Vanadium	--	--	--	--	Vanadium	circulatory	1.4E-003	--	9.6E-002	9.7E-002
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	6.5E-006	--	4.8E-004	4.9E-004
			Zinc	--	--	--	--	Zinc	thyroid	2.8E-004	--	6.2E-002	6.2E-002
			(Total)	6.2E-006	--	4.4E-004	4.5E-004	(Total)	--	4.0E-001	--	6.3E+001	6.3E+001
Air	Air	Area 1, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	1.44E-004	--	1.4E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	8.18E-005	--	8.2E-005
			1,1,2-Trichloroethane	--	1.58E-009	--	1.6E-009	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.85E-009	--	1.9E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	4.05E-003	--	4.1E-003
			1,2-Dichloroethane	--	2.62E-007	--	2.6E-007	1,2-Dichloroethane	circulatory	--	5.77E-003	--	5.8E-003
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	7.01E-003	--	7.0E-003
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	3.30E-005	--	3.3E-005
			1,4-Dichlorobenzene	--	5.46E-009	--	5.5E-009	1,4-Dichlorobenzene	liver	--	3.03E-006	--	3.0E-006
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	1.28E-008	--	1.3E-008
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.24E-001	--	1.2E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	1.03E-003	--	1.0E-003
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE	--	--	--	--	--

Table 6-1-7  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Current  
Receptor Population Routine Worker  
Receptor Age: Adult

File: Area1RME.wk4\TT\_sum\_chiWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			4,4'-DDT	--	1.11E-012	--	1.1E-012	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Aldrin	--	2.70E-010	--	2.7E-010	Aldrin	--	--	--	--	--
			alpha-BHC	--	5.47E-012	--	5.5E-012	alpha-BHC	--	--	--	--	--
			Anthracene	--	--	--	--	Anthracene	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	--	--	--	--	--
			Aroclor-1242	--	4.28E-011	--	4.3E-011	Aroclor-1242	--	--	--	--	--
			Aroclor-1248	--	3.12E-010	--	3.1E-010	Aroclor-1248	--	--	--	--	--
			Aroclor-1254	--	4.06E-010	--	4.1E-010	Aroclor-1254	--	--	--	--	--
			Aroclor-1260	--	1.86E-009	--	1.9E-009	Aroclor-1260	--	--	--	--	--
			Arsenic	--	2.17E-009	--	2.2E-009	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	1.96E-004	--	2.0E-004
			Benzene	--	2.18E-007	--	2.2E-007	Benzene	blood disorders	--	1.24E-002	--	1.2E-002
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	2.34E-011	--	2.3E-011	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	--	--	--	--	--
			Beryllium	--	1.16E-009	--	1.2E-009	Beryllium	respiratory	--	6.77E-005	--	6.8E-005
			beta-BHC	--	2.97E-012	--	3.0E-012	beta-BHC	--	--	--	--	--
			bis(2-Chloroethyl) ether	--	2.64E-006	--	2.6E-006	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	2.05E-011	--	2.0E-011	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	2.53E-009	--	2.5E-009	Cadmium	--	--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	--	--	5.97E-008	--	6.0E-008
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	2.29E-004	--	2.3E-004
			Chloroform	--	8.15E-007	--	8.2E-007	Chloroform	liver	--	3.28E-001	--	3.3E-001
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	3.33E-008	--	3.3E-008	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	4.51E-004	--	4.5E-004
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			Heptachlor	--	1.20E-013	--	1.2E-013	Heptachlor	--	--	--	--	--
			Heptachlor epoxide	--	1.16E-013	--	1.2E-013	Heptachlor epoxide	--	--	--	--	--
			Hexachlorobenzene	--	2.03E-012	--	2.0E-012	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	2.80E-012	--	2.8E-012	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--

Table 6-1-7  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario: Timeframe: Current  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area1RME.wk4\11T\_sum\_cWsa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	1.08E-002	--	1.1E-002
			Mercury	--		--		Mercury	CNS	--	6.26E-006	--	6.3E-006
			Methylene Chloride	--	4.09E-008	--	4.1E-008	Methylene Chloride	respiratory	--	8.06E-005	--	8.1E-005
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	2.05E-002	--	2.1E-002
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	1.90E-005	--	1.9E-005
			Tetrachloroethene	--	2.32E-007	--	2.3E-007	Tetrachloroethene	liver	--	2.32E-003	--	2.3E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	1.28E-002	--	1.3E-002
			Trichloroethene	--	2.05E-007	--	2.0E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	1.15E-007	--	1.1E-007	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		4.6E-006		4.6E-006	(total)			5.3E-001		5.3E-001
			Total Risk Across Surface Soil				4.5E-004	Total Hazard Index Across Surface Soil					6.3E+001
			Total Risk Across All Media and All Exposure Routes				Reserved						

Total Kidney HI:	2.7E+001
Total Skin HI:	1.3E+001
Total Thyroid HI:	6.2E-002
Total Liver HI:	1.9E+001
Total Circulatory System HI:	1.7E+000
Total CNS HI:	1.4E-001
Total Fetus HI:	6.9E-004
Total GI Tract HI:	1.0E-003
Total Respiratory HI:	1.1E-002
Total Eyes HI:	0.0E+000
Total Reproductive HI:	0.0E+000
Total Mammary HI:	0.0E+000
Total Adrenal HI:	1.2E-006
Total Heart HI:	3.4E-003
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	6.2E-002
Total Blood Disorders HI:	1.2E-02



Table 6-1-8  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: Area1CT.wk4\TT\_sum.ctb\Area1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 1, Surface Soil (0' to 2')	1,1,2-Trichloroethane	2.0E-011	--	5.6E-010	5.6E-010	1,1,2-Trichloroethane	blood disorders	1.2E-006	--	3.4E-005	3.6E-005
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	kidney	5.0E-007	--	1.1E-005	1.2E-005
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	6.4E-006	--	1.5E-004	1.5E-004
			3,3'-Dichlorobenzidine	2.5E-009	--	5.8E-008	6.0E-008	3,3'-Dichlorobenzidine	liver	--	--	--	--
			Aluminum	--	--	--	--	Aluminum	circulatory	6.3E-003	--	1.4E-001	1.5E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	1.1E-007	--	2.5E-006	2.7E-006
			Antimony	--	--	--	--	Antimony	skin	8.8E-004	--	2.0E+000	2.0E+000
			Aroclor-1242	2.7E-008	--	6.2E-007	6.4E-007	Aroclor-1242	liver	--	--	--	--
			Aroclor-1248	3.6E-008	--	8.2E-007	8.6E-007	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	2.9E-007	--	7.6E-006	7.9E-006	Aroclor-1254	liver	1.0E-001	--	2.6E+000	2.8E+000
			Aroclor-1260	4.3E-008	--	9.9E-007	1.0E-006	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	1.1E-007	--	2.7E-006	2.8E-006	Arsenic	circulatory	3.5E-003	--	8.3E-002	8.7E-002
			Barium	--	--	--	--	Barium	circulatory	1.0E-003	--	2.3E-002	2.4E-002
			Benzo(a)anthracene	1.2E-009	--	2.6E-008	2.8E-008	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	1.6E-008	--	4.3E-007	4.5E-007	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	1.7E-009	--	3.8E-008	4.0E-008	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	1.4E-010	--	3.2E-009	3.4E-009	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	1.1E-003	--	2.5E+000	2.5E+000
			bis(2-Ethylhexyl)phthalate	3.7E-009	--	8.4E-008	8.8E-008	bis(2-Ethylhexyl)phthalate	liver	1.8E-004	--	4.2E-003	4.4E-003
			Cadmium	--	--	--	--	Cadmium	kidney	6.2E-004	--	5.7E-001	5.7E-001
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	adrenal	7.5E-009	--	1.7E-007	1.8E-007
			Nickel	--	--	--	--	Nickel	low body wt	1.4E-004	--	6.6E-002	6.6E-002
			Selenium	--	--	--	--	Selenium	liver	3.4E-005	--	7.9E-004	8.2E-004
			Silver	--	--	--	--	Silver	skin	2.2E-005	--	2.4E-003	2.4E-003
			Tetrachloroethene	1.3E-009	--	2.9E-008	3.0E-008	Tetrachloroethene	liver	3.4E-005	--	7.7E-004	8.0E-004
			Toluene	--	--	--	--	Toluene	liver	3.3E-007	--	7.6E-006	8.0E-006
			Trichloroethene	4.2E-011	--	9.9E-010	1.0E-009	Trichloroethene	liver	9.0E-006	--	2.1E-004	2.2E-004
			Vanadium	--	--	--	--	Vanadium	circulatory	6.3E-004	--	1.4E-002	1.5E-002
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	2.9E-008	--	7.3E-005	7.6E-005
			Zinc	--	--	--	--	Zinc	thyroid	1.2E-004	--	9.3E-003	9.4E-003
			(Total)	5.4E-007	--	1.3E-005	1.4E-005	(Total)	thyroid	1.8E-001	--	9.4E+000	9.6E+000
	Air	Area 1, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	1.26E-004	--	1.3E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	7.17E-005	--	7.2E-005
			1,1,2-Trichloroethane	--	2.77E-010	--	2.8E-010	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	3.25E-010	--	3.2E-010	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	3.55E-003	--	3.5E-003
			1,2-Dichloroethane	--	4.60E-008	--	4.6E-008	1,2-Dichloroethane	circulatory	--	5.05E-003	--	5.1E-003
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	6.14E-003	--	6.1E-003
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	2.89E-005	--	2.9E-005
			1,4-Dichlorobenzene	--	9.56E-010	--	9.6E-010	1,4-Dichlorobenzene	liver	--	2.66E-006	--	2.7E-006
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	1.12E-008	--	1.1E-008
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.09E-001	--	1.1E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	9.04E-004	--	9.0E-004
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE	--	--	--	--	--
			4,4'-DDT	--	1.95E-013	--	2.0E-013	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Aldrin	--	4.72E-011	--	4.7E-011	Aldrin	--	--	--	--	--
			alpha-BHC	--	9.58E-013	--	9.6E-013	alpha-BHC	--	--	--	--	--
			Anthracene	--	--	--	--	Anthracene	--	--	--	--	--

Table 6-1-8  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area1CT.wh4\TT\_sum.ctw\1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Antimony	--		--		Antimony				--	
			Aroclor-1242	--	7.51E-012	--	7.5E-012	Aroclor-1242				--	
			Aroclor-1248	--	5.47E-011	--	5.5E-011	Aroclor-1248				--	
			Aroclor-1254	--	7.11E-011	--	7.1E-011	Aroclor-1254				--	
			Aroclor-1260	--	3.26E-010	--	3.3E-010	Aroclor-1260				--	
			Arsenic	--	3.79E-010	--	3.8E-010	Arsenic	respiratory			--	
			Barium	--		--		Barium	fetotoxic			--	
			Benzene	--	3.82E-008	--	3.8E-008	Benzene	blood disorders		1.72E-004	--	1.7E-004
			Benzoic Acid	--		--		Benzoic Acid			1.08E-002	--	1.1E-002
			Benzo(a)anthracene	--		--		Benzo(a)anthracene				--	
			Benzo(a)pyrene	--	4.10E-012	--	4.1E-012	Benzo(a)pyrene				--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene				--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene				--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene				--	
			Benzyl Alcohol	--		--		Benzyl Alcohol				--	
			Beryllium	--	2.03E-010	--	2.0E-010	Beryllium	respiratory		5.93E-005	--	5.9E-005
			beta-BHC	--	5.21E-013	--	5.2E-013	beta-BHC				--	
			bis(2-Chloroethyl) ether	--	4.62E-007	--	4.6E-007	bis(2-Chloroethyl) ether	liver			--	
			bis(2-Ethylhexyl)phthalate	--	3.58E-012	--	3.6E-012	bis(2-Ethylhexyl)phthalate				--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate				--	
			Cadmium	--	4.42E-010	--	4.4E-010	Cadmium				--	
			Carbon Disulfide	--		--		Carbon Disulfide			5.23E-008	--	5.2E-008
			Chlorobenzene	--		--		Chlorobenzene	liver		2.01E-004	--	2.0E-004
			Chloroform	--	1.43E-007	--	1.4E-007	Chloroform	liver		2.87E-001	--	2.9E-001
			Chromium 3+	--		--		Chromium 3+				--	
			Chromium 6+	--	5.83E-009	--	5.8E-009	Chromium 6+	respiratory			--	
			Chrysene	--		--		Chrysene				--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene				--	
			Cobalt	--		--		Cobalt				--	
			Copper	--		--		Copper				--	
			Cyanide (total)	--		--		Cyanide (total)				--	
			Dibenzofuran	--		--		Dibenzofuran				--	
			Diethylphthalate	--		--		Diethylphthalate				--	
			Dimethylphthalate	--		--		Dimethylphthalate				--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate				--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate				--	
			Endrin ketone	--		--		Endrin ketone				--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory		3.95E-004	--	3.9E-004
			Fluoranthene	--		--		Fluoranthene				--	
			Fluorene	--		--		Fluorene				--	
			Heptachlor	--	2.10E-014	--	2.1E-014	Heptachlor				--	
			Heptachlor epoxide	--	2.03E-014	--	2.0E-014	Heptachlor epoxide				--	
			Hexachlorobenzene	--	3.56E-013	--	3.6E-013	Hexachlorobenzene	liver			--	
			Hexachlorobutadiene	--	4.91E-013	--	4.9E-013	Hexachlorobutadiene	kidney			--	
			Hexane, n-	--		--		Hexane, n-				--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene				--	
			Isophorone	--		--		Isophorone				--	
			Lead	--		--		Lead				--	
			Manganese	--		--		Manganese	respiratory		9.49E-003	--	9.5E-003
			Mercury	--		--		Mercury	CNS		5.48E-006	--	5.5E-006
			Methylene Chloride	--	7.16E-009	--	7.2E-009	Methylene Chloride	respiratory		7.06E-005	--	7.1E-005
			m,p-xylene	--		--		m,p-xylene				--	
			Naphthalene	--		--		Naphthalene	circulatory		1.80E-002	--	1.8E-002
			Nickel	--		--		Nickel	respiratory			--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine				--	
			ortho-xylene	--		--		ortho-xylene				--	
			Pentachlorophenol	--		--		Pentachlorophenol				--	
			Phenanthrene	--		--		Phenanthrene				--	
			Phenol	--		--		Phenol				--	
			Pyrene	--		--		Pyrene				--	

Table 6-1-8  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: AreaICT.wh\1TT\_sum.ctb\AreaICT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	1.67E-005	--	1.7E-005
			Tetrachloroethene	--	4.06E-008	--	4.1E-008	Tetrachloroethene	liver	--	2.03E-003	--	2.0E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	1.12E-002	--	1.1E-002
			Trichloroethene	--	3.59E-008	--	3.6E-008	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	2.01E-008	--	2.0E-008	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		8.0E-007		8.0E-007	(total)			4.6E-001		4.6E-001
Total Risk Across Surface Soil							1.5E-005	Total Hazard Index Across Surface Soil					1.0E+001
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	4.2E+000
Total Skin HI:	2.0E+000
Total Thyroid HI:	9.4E-003
Total Liver HI:	3.1E+000
Total Circulatory System HI:	2.8E-001
Total CNS HI:	1.2E-001
Total Fetotoxic HI:	2.5E-004
Total GI Tract HI:	1.5E-004
Total Respiratory HI:	1.0E-002
Total Eyes HI:	0.0E+000
Total Reproductive HI:	0.0E+000
Total Mammary HI:	0.0E+000
Total Adrenal HI:	1.8E-007
Total Heart HI:	5.4E-004
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	9.4E-003
Total Blood Disorders HI:	1.1E-002

Table 6-1-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area1RME.wk4\1.TT\_sum\_IRWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	1.9E-004	--	1.2E-002	1.3E-002
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	9.0E-001	--	6.0E+001	6.0E+001
			1,1,2-Trichloroethane	1.4E-007	--	1.2E-005	1.2E-005	1,1,2-Trichloroethane	blood disorders	1.7E-003	--	1.4E-001	1.4E-001
			1,1,2,2-Tetrachloroethane	2.4E-007	--	2.3E-005	2.3E-005	1,1,2,2-Tetrachloroethane	liver	5.6E-005	--	5.3E-003	5.3E-003
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	2.7E-004	--	1.8E-002	1.8E-002
			1,2-Dichloroethane	1.1E-006	--	7.4E-005	7.5E-005	1,2-Dichloroethane	fetotoxic	1.1E-003	--	7.6E-002	7.7E-002
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	kidney	2.3E-002	--	1.5E+000	1.5E+000
			1,2-Dichloropropane	4.6E-007	--	3.0E-005	3.1E-005	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	3.7E-004	--	2.4E-002	2.5E-002
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	circulatory	2.5E-005	--	1.7E-003	1.7E-003
			1,4-Dichlorobenzene	3.8E-008	--	2.5E-006	2.6E-006	1,4-Dichlorobenzene	GI tract	1.5E-004	--	9.8E-003	1.0E-002
			2-Butanone	--	--	--	--	2-Butanone	liver	7.6E-004	--	5.3E-002	5.4E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.4E-002	--	9.1E-001	9.2E-001
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	2.1E-004	--	1.4E-002	1.4E-002
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	kidney	1.2E-003	--	7.8E-002	7.9E-002
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	5.1E-004	--	3.4E-002	3.5E-002
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	1.6E-002	--	1.1E+000	1.1E+000
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	3.0E-003	--	3.1E-001	3.1E-001
			4,4'-DDT	7.2E-007	--	4.8E-005	4.8E-005	4,4'-DDT	fetotoxic	1.2E-002	--	7.8E-001	8.0E-001
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	1.6E-004	--	1.0E-002	1.1E-002
			Acetone	--	--	--	--	Acetone	fetotoxic	5.6E-003	--	4.7E-001	4.8E-001
			Aluminum	--	--	--	--	Aluminum	circulatory	7.0E-003	--	4.7E-001	4.7E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	3.1E-006	--	2.1E-004	2.1E-004
			Antimony	--	--	--	--	Antimony	skin	1.8E-002	--	1.2E+002	1.2E+002
			Aroclor-1242	3.2E-005	--	2.1E-003	2.2E-003	Aroclor-1242	liver	--	--	--	--
			Aroclor-1248	4.5E-005	--	3.0E-003	3.0E-003	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	6.1E-005	--	4.6E-003	4.6E-003	Aroclor-1254	liver	4.3E+000	--	3.2E+002	3.2E+002
			Aroclor-1260	1.3E-005	--	8.9E-004	9.1E-004	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	1.6E-006	--	1.1E-004	1.1E-004	Arsenic	circulatory	1.0E-002	--	7.0E-001	7.1E-001
			Barium	--	--	--	--	Barium	--	2.0E-003	--	1.3E-001	1.3E-001
			Benzene	5.9E-005	--	4.3E-003	4.4E-003	Benzene	blood disorders	1.9E+000	--	1.4E+002	1.4E+002
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	2.8E-006	--	1.8E-004	1.9E-004
			Benzo(a)anthracene	3.8E-008	--	2.5E-006	2.6E-006	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	4.1E-007	--	3.2E-005	3.3E-005	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	8.7E-008	--	5.8E-006	5.9E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	8.7E-009	--	5.8E-007	5.9E-007	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	6.6E-004	--	4.4E+000	4.4E+000
			bis(2-Chloroethyl) ether	3.5E-006	--	2.3E-004	2.3E-004	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	1.1E-005	--	7.4E-004	7.5E-004	bis(2-Ethylhexyl)phthalate	liver	1.1E-001	--	7.4E+000	7.5E+000
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	2.0E-003	--	1.4E-001	1.4E-001
			Cadmium	--	--	--	--	Cadmium	kidney	1.2E-002	--	3.2E+001	3.2E+001
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	4.3E-004	--	9.2E-002	9.2E-002
			Chloroform	3.9E-006	--	2.7E-004	2.8E-004	Chloroform	circulatory	1.8E-001	--	1.2E+001	1.3E+001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	5.1E-005	--	8.4E-001	8.4E-001
			Chrysene	5.8E-010	--	9.4E-008	9.4E-008	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	1.0E-001	--	6.8E+000	6.9E+000
			Cobalt	--	--	--	--	Cobalt	heart	1.0E-004	--	6.9E-003	7.0E-003
			Copper	--	--	--	--	Copper	liver	1.1E-003	--	1.3E-001	1.3E-001
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	1.6E-004	--	2.1E-002	2.1E-002
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	9.0E-004	--	6.0E-002	6.0E-002
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	2.6E-005	--	1.7E-003	1.7E-003
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	5.1E-006	--	3.4E-004	3.4E-004
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	2.1E-003	--	1.5E-001	1.5E-001
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	4.2E-004	--	2.8E-002	2.8E-002
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	5.7E-002	--	4.1E+000	4.2E+000

Scenario Timeframe: Future  
 Receptor Population: Routine Worker  
 Receptor Age: Adult

Table 6-1-9  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

Ffe\_Area1RME wk41 TT sum\_RWAtRME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Fluoranthene		--			Fluoranthene	kidney	8.1E-005	--	5.4E-003	5.5E-003
			Fluorene		--			Fluorene	skeletal	2.0E-004	--	1.3E-002	1.4E-002
			Hexachlorobenzene	2.9E-007	--	2.4E-005	2.4E-005	Hexachlorobenzene	liver	6.3E-004	--	5.2E-002	5.3E-002
			Hexachlorobutadiene	1.9E-007	--	1.3E-005	1.3E-005	Hexachlorobutadiene	low body wt	3.4E-002	--	2.3E+000	2.3E+000
			Iron		--			Iron		1.9E-002	--	1.3E+000	1.3E+000
			Isophorone	8.6E-008	--	5.7E-006	5.8E-006	Isophorone	kidney	1.3E-003	--	8.4E-002	8.5E-002
			Lead		--			Lead	CNS	--	--		
			Manganese		--			Manganese	kidney	4.9E-002	--	3.2E+000	3.3E+000
			Mercury		--			Mercury	low body wt	--	--		
			Methylene Chloride	1.3E-006	--	1.6E-004	1.6E-004	Methylene Chloride	liver	8.1E-003	--	9.8E-001	9.9E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	2.4E-003	--	1.7E-001	1.8E-001
			Naphthalene		--			Naphthalene	circulatory	2.0E-002	--	1.3E+000	1.3E+000
			Nickel		--			Nickel	low body wt	3.4E-004	--	4.5E-001	4.5E-001
			ortho-xylene		--			ortho-xylene	fetotoxic	4.7E-004	--	3.5E-002	3.5E-002
			Pentachlorophenol	7.2E-007	--	4.8E-005	4.9E-005	Pentachlorophenol	liver	5.6E-004	--	3.7E-002	3.8E-002
			Phenol		--			Phenol	liver	2.7E-005	--	1.8E-003	1.8E-003
			Pyrene		--			Pyrene	liver	1.7E-004	--	1.1E-002	1.1E-002
			Selenium		--			Selenium	liver	7.4E-005	--	4.9E-003	5.0E-003
			Silver		--			Silver	skin	2.9E-004	--	9.0E-002	9.1E-002
			Styrene		--			Styrene	liver	3.9E-004	--	2.6E-002	2.6E-002
			Tetrachloroethene	1.3E-004	--	8.7E-003	8.9E-003	Tetrachloroethene	liver	7.1E-001	--	4.7E+001	4.8E+001
			Toluene		--			Toluene	liver	8.6E-001	--	5.7E+001	5.8E+001
			Trichloroethene	9.4E-006	--	6.4E-004	6.5E-004	Trichloroethene	liver	4.0E-001	--	2.7E+001	2.7E+001
			Vanadium		--			Vanadium	circulatory	1.4E-003	--	9.5E-002	9.7E-002
			Xylenes (total)		--			Xylenes (total)	fetotoxic	1.1E-002	--	7.9E-001	8.0E-001
			Zinc		--			Zinc	thyroid	6.5E-004	--	1.4E-001	1.5E-001
			(total)	3.8E-004	--	2.6E-002	2.6E-002	(total)		9.8E+000	--	8.5E+002	8.6E+002
	AIR	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	9.3E-004	--	9.3E-004
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	2.4E-002	--	2.4E-002
			1,1,2-Trichloroethane	--	7.9E-007	--	7.9E-007	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.2E-006	--	1.2E-006	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	1.9E-002	--	1.9E-002
			1,2-Dichloroethane	--	5.2E-006	--	5.2E-006	1,2-Dichloroethane	circulatory	--	1.1E-001	--	1.1E-001
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	2.8E-001	--	2.8E-001
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	1.0E-004	--	1.0E-004
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	4.3E-008	--	4.3E-008
			1,4-Dichlorobenzene	--	4.2E-007	--	4.2E-007	1,4-Dichlorobenzene	liver	--	2.3E-004	--	2.3E-004
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.7E-007	--	1.7E-007
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	1.2E-001	--	1.2E-001
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	--
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.9E-002	--	1.9E-002
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	--
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	--
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	--
			4,4'-DDT	--	5.8E-011	--	5.8E-011	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	--

Table 6-1-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Aca1RME.wk41 IT sum RWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	2.7E-010	--	2.7E-010	Aldrin		--		--	
			alpha-BHC	--	5.5E-012	--	5.5E-012	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	2.2E-009	--	2.2E-009	Aroclor-1242		--		--	
			Aroclor-1248	--	1.8E-009	--	1.8E-009	Aroclor-1248		--		--	
			Aroclor-1254	--	2.7E-009	--	2.7E-009	Aroclor-1254		--		--	
			Aroclor-1260	--	3.4E-009	--	3.4E-009	Aroclor-1260		--		--	
			Arsenic	--	2.9E-009	--	2.9E-009	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--	2.6E-004	--	2.6E-004
			Benzene	--	1.3E-005	--	1.3E-005	Benzene	blood disorders	--	7.3E-001	--	7.3E-001
			Benzoic Acid	--		--		Benzoic Acid		--		--	
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	1.6E-011	--	1.6E-011	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	3.0E-010	--	3.0E-010	Beryllium	respiratory	--	1.7E-005	--	1.7E-005
			beta-BHC	--	3.0E-012	--	3.0E-012	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	2.2E-005	--	2.2E-005	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	1.8E-010	--	1.8E-010	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	5.8E-009	--	5.8E-009	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	1.2E-008	--	1.2E-008
			Chlorobenzene	--		--		Chlorobenzene	liver	--	4.2E-002	--	4.2E-002
			Chloroform	--	3.7E-005	--	3.7E-005	Chloroform	liver	--	1.5E+001	--	1.5E+001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	6.6E-008	--	6.6E-008	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Dieldrin	--	1.3E-010	--	1.3E-010	Dieldrin		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	4.5E-003	--	4.5E-003
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			gamma-Chlordane	--	1.5E-011	--	1.5E-011	gamma-Chlordane		--	5.9E-007	--	5.9E-007
			Heptachlor	--	2.4E-014	--	2.4E-014	Heptachlor		--		--	
			Heptachlor epoxide	--	2.3E-014	--	2.3E-014	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	4.1E-013	--	4.1E-013	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.9E-011	--	1.9E-011	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	

Table 6-1-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area1RME wk4\11\_sum\_RW\Area1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	4.8E-003	--	4.8E-003
			Mercury	--		--		Mercury	CNS	--	4.5E-006	--	4.5E-006
			Methylene Chloride	--	1.2E-005	--	1.2E-005	Methylene Chloride	respiratory	--	2.3E-002	--	2.3E-002
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	1.7E-001	--	1.7E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Phthalic anhydride	--		--		Phthalic anhydride		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	5.1E-004	--	5.1E-004
			Tetrachloroethene	--	1.5E-006	--	1.5E-006	Tetrachloroethene	liver	--	1.5E-002	--	1.5E-002
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	6.6E-002	--	6.6E-002
			Trichloroethene	--	3.7E-006	--	3.7E-006	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	1.1E-007	--	1.1E-007	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		9.6E-005		9.6E-005	(total)			1.7E+001		1.7E+001
Total Risk Across Subsurface Soil							2.7E-002	Index Across Subsurface Soil					8.8E+002
Total Risk Across All Media and All Exposure Routes							Reserved	Total Hazard Index Across Subsurface Soil					

Total Kidney HI:	4.2E+001
Total Skin HI:	1.2E+002
Total Thyroid HI:	1.5E-001
Total Liver HI:	5.5E+002
Total Circulatory System HI:	2.2E+001
Total CNS HI:	2.3E-001
Total Fetotoxic HI:	2.4E+000
Total GI Tract HI:	9.3E-001
Total Respiratory HI:	3.4E-001
Total Eyes HI:	1.1E-002
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.4E-001
Total Adrenal HI:	0.0E+000
Total Heart HI:	7.0E-003
Total Skeletal System HI:	1.4E-002
Total Thyroid HI:	1.5E-001
Total Blood Disorders HI:	1.4E+002

Table 6-1-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age Adult

File: Arsa1CT.wk41.TT\_sum\_RWsa1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	8.3E-005	--	1.9E-003	2.0E-003
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	3.9E-001	--	9.0E+000	9.4E+000
			1,1,2-Trichloroethane	1.2E-008	--	3.5E-007	3.6E-007	1,1,2-Trichloroethane	blood disorders	7.6E-004	--	2.1E-002	2.2E-002
			1,1,2,2-Tetrachloroethane	2.1E-008	--	6.8E-007	7.0E-007	1,1,2,2-Tetrachloroethane	liver	2.4E-005	--	8.0E-004	8.2E-004
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	1.2E-004	--	2.7E-003	2.8E-003
			1,2-Dichloroethane	9.8E-008	--	2.2E-006	2.3E-006	1,2-Dichloroethane	fetotoxic	5.0E-004	--	1.1E-002	1.2E-002
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	1.0E-002	--	2.3E-001	2.4E-001
			1,2-Dichloropropane	4.0E-008	--	9.2E-007	9.6E-007	1,2-Dichloropropane	GI tract		--		
			1,2,4-Trichlorobenzene		--			1,2,4-Trichlorobenzene	low body wt	1.6E-004	--	3.7E-003	3.8E-003
			1,3-Dichlorobenzene		--			1,3-Dichlorobenzene	circulatory	1.1E-005	--	2.5E-004	2.6E-004
			1,4-Dichlorobenzene	3.3E-009	--	7.6E-008	8.0E-008	1,4-Dichlorobenzene	GI tract	6.5E-005	--	1.5E-003	1.6E-003
			2-Butanone		--			2-Butanone	liver	3.3E-004	--	8.0E-003	8.3E-003
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	6.0E-003	--	1.4E-001	1.4E-001
			2-Methylphenol		--			2-Methylphenol	liver	9.1E-005	--	2.1E-003	2.2E-003
			2,4-Dichlorophenol		--			2,4-Dichlorophenol	kidney	5.1E-004	--	1.2E-002	1.2E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	2.3E-004	--	5.1E-003	5.4E-003
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	7.0E-003	--	1.6E-001	1.7E-001
			4-Methylphenol		--			4-Methylphenol	respiratory	1.3E-003	--	4.7E-002	4.8E-002
			4,4'-DDT	6.3E-008	--	1.4E-006	1.5E-006	4,4'-DDT	fetotoxic	5.2E-003	--	1.2E-001	1.2E-001
			Acenaphthene		--			Acenaphthene	eyes	6.9E-005	--	1.6E-003	1.6E-003
			Acetone		--			Acetone	fetotoxic	2.4E-003	--	7.1E-002	7.3E-002
			Aluminum		--			Aluminum	circulatory	3.1E-003	--	7.0E-002	7.4E-002
			Anthracene		--			Anthracene	GI tract	1.4E-006	--	3.1E-005	3.3E-005
			Antimony		--			Antimony	skin	7.8E-003	--	1.8E+001	1.8E+001
			Aroclor-1242	2.8E-006	--	6.4E-005	6.7E-005	Aroclor-1242	liver		--		
			Aroclor-1248	3.9E-006	--	8.9E-005	9.3E-005	Aroclor-1248	liver		--		
			Aroclor-1254	5.4E-006	--	1.4E-004	1.4E-004	Aroclor-1254	liver	1.9E+000	--	4.8E+001	5.0E+001
			Aroclor-1260	1.2E-006	--	2.7E-005	2.8E-005	Aroclor-1260	circulatory		--		
			Arsenic	1.4E-007	--	3.4E-006	3.6E-006	Arsenic	circulatory	4.4E-003	--	1.1E-001	1.1E-001
			Barium		--			Barium		8.6E-004	--	2.0E-002	2.0E-002
			Benzene	5.1E-006	--	1.3E-004	1.4E-004	Benzene	blood disorders	8.3E-001	--	2.1E+001	2.2E+001
			Benzoic Acid		--			Benzoic Acid	GI tract	1.2E-006	--	2.8E-005	2.9E-005
			Benzo(a)anthracene	3.3E-009	--	7.6E-008	7.9E-008	Benzo(a)anthracene			--		
			Benzo(a)pyrene	3.6E-008	--	9.7E-007	1.0E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	7.6E-009	--	1.7E-007	1.8E-007	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	7.6E-010	--	1.7E-008	1.8E-008	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	2.9E-004	--	6.7E-001	6.7E-001
			bis(2-Chloroethyl) ether	3.0E-007	--	7.0E-006	7.3E-006	bis(2-Chloroethyl) ether	reproductive		--		
			bis(2-Ethylhexyl)phthalate	9.8E-007	--	2.2E-005	2.3E-005	bis(2-Ethylhexyl)phthalate	liver	4.9E-002	--	1.1E+000	1.2E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	9.0E-004	--	2.0E-002	2.1E-002
			Cadmium		--			Cadmium	kidney	5.3E-003	--	4.9E+000	4.9E+000
			Chlorobenzene		--			Chlorobenzene	liver	1.9E-004	--	1.4E-002	1.4E-002
			Chloroform	3.4E-007	--	8.2E-006	8.6E-006	Chloroform	circulatory	7.9E-002	--	1.9E+000	2.0E+000
			Chromium 3+		--			Chromium 3+	liver	2.2E-005	--	1.3E-001	1.3E-001
			Chrysene	5.1E-011	--	2.8E-009	2.9E-009	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	4.5E-002	--	1.0E+000	1.1E+000
			Cobalt		--			Cobalt	heart	4.6E-005	--	1.0E-003	1.1E-003
			Copper		--			Copper	liver	5.0E-004	--	1.9E-002	1.9E-002
			Cyanide (total)		--			Cyanide (total)	liver	7.0E-005	--	3.2E-003	3.3E-003
			Dibenzofuran		--			Dibenzofuran	dec growth rate	3.9E-004	--	9.0E-003	9.4E-003
			Diethylphthalate		--			Diethylphthalate	low body wt	1.1E-005	--	2.6E-004	2.7E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	2.2E-006	--	5.1E-005	5.3E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	9.3E-004	--	2.2E-002	2.3E-002
			Di-n-octylphthalate		--			Di-n-octylphthalate		1.8E-004	--	4.2E-003	4.4E-003
			Ethyl Benzene		--			Ethyl Benzene	liver	2.5E-002	--	6.2E-001	6.5E-001



Table 6-1-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age: Adult

File\_Area1CT.wk4\11T\_sum\_IRWatCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Fluoranthene		--			Fluoranthene	kidney	3.6E-005	--	8.1E-004	8.5E-004
			Fluorene		--			Fluorene	skeletal	8.9E-005	--	2.0E-003	2.1E-003
			Hexachlorobenzene	2.5E-008	--	7.2E-007	7.5E-007	Hexachlorobenzene	liver	2.8E-004	--	7.9E-003	8.2E-003
			Hexachlorobutadiene	1.7E-008	--	3.8E-007	4.0E-007	Hexachlorobutadiene	low body wt	1.5E-002	--	3.4E-001	3.6E-001
			Iron		--			Iron		8.4E-003	--	1.9E-001	2.0E-001
			Isophorone	7.5E-009	--	1.7E-007	1.8E-007	Isophorone	kidney	5.6E-004	--	1.3E-002	1.3E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	2.1E-002	--	4.9E-001	5.1E-001
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	1.1E-007	--	4.8E-006	4.9E-006	Methylene Chloride	liver	3.6E-003	--	1.5E-001	1.5E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	1.0E-003	--	2.6E-002	2.7E-002
			Naphthalene		--			Naphthalene	circulatory	8.7E-003	--	2.0E-001	2.1E-001
			Nickel		--			Nickel	low body wt	1.5E-004	--	6.8E-002	6.8E-002
			ortho-xylene		--			ortho-xylene	fetotoxic	2.1E-004	--	5.2E-003	5.4E-003
			Pentachlorophenol	6.3E-008	--	1.4E-006	1.5E-006	Pentachlorophenol	liver	2.5E-004	--	5.6E-003	5.9E-003
			Phenol		--			Phenol	liver	1.2E-005	--	2.7E-004	2.8E-004
			Pyrene		--			Pyrene	liver	7.4E-005	--	1.7E-003	1.8E-003
			Selenium		--			Selenium	liver	3.2E-005	--	7.4E-004	7.7E-004
			Silver		--			Silver	skin	1.3E-004	--	1.4E-002	1.4E-002
			Styrene		--			Styrene	liver	1.7E-004	--	3.9E-003	4.0E-003
			Tetrachloroethene	1.2E-005	--	2.6E-004	2.8E-004	Tetrachloroethene	liver	3.1E-001	--	7.1E+000	7.4E+000
			Toluene		--			Toluene	liver	3.8E-001	--	8.6E+000	8.9E+000
			Trichloroethene	8.3E-007	--	1.9E-005	2.0E-005	Trichloroethene	liver	1.8E-001	--	4.1E+000	4.3E+000
			Vanadium		--			Vanadium	circulatory	6.3E-004	--	1.4E-002	1.5E-002
			Xylenes (total)		--			Xylenes (total)	fetotoxic	4.7E-003	--	1.2E-001	1.2E-001
			Zinc		--			Zinc	thyroid	2.9E-004	--	2.2E-002	2.2E-002
			(total)	3.3E-005		7.9E-004	8.2E-004	(total)		4.3E+000		1.3E+002	1.3E+002
	AIR	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	8.1E-004	--	8.1E-004
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	2.1E-002	--	2.1E-002
			1,1,2-Trichloroethane	--	1.4E-007	--	1.4E-007	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	2.1E-007	--	2.1E-007	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	1.7E-002	--	1.7E-002
			1,2-Dichloroethane	--	9.1E-007	--	9.1E-007	1,2-Dichloroethane	circulatory	--	1.0E-001	--	1.0E-001
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	2.4E-001	--	2.4E-001
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	8.8E-005	--	8.8E-005
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	3.8E-008	--	3.8E-008
			1,4-Dichlorobenzene	--	7.4E-008	--	7.4E-008	1,4-Dichlorobenzene	liver	--	2.1E-004	--	2.1E-004
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.5E-007	--	1.5E-007
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	1.1E-001	--	1.1E-001
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	--
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.6E-002	--	1.6E-002
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	--
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	--
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	--
			4,4'-DDT	--	1.0E-011	--	1.0E-011	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	--

Table 6-1-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age: Adult

File: Area1CT.wk4\TT\_sum\_RRwa1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	4.7E-011	--	4.7E-011	Aldrin		--		--	
			alpha-BHC	--	9.6E-013	--	9.6E-013	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	3.8E-010	--	3.8E-010	Aroclor-1242		--		--	
			Aroclor-1248	--	3.1E-010	--	3.1E-010	Aroclor-1248		--		--	
			Aroclor-1254	--	4.7E-010	--	4.7E-010	Aroclor-1254		--		--	
			Aroclor-1260	--	5.9E-010	--	5.9E-010	Aroclor-1260		--		--	
			Arsenic	--	5.0E-010	--	5.0E-010	Arsenic	respiratory			--	
			Barium	--		--		Barium	fetotoxic			--	
			Benzene	--	2.3E-006	--	2.3E-006	Benzene	blood disorders		2.2E-004	--	2.2E-004
			Benzoic Acid	--		--		Benzoic Acid			6.4E-001	--	6.4E-001
			Benzo(a)anthracene	--		--		Benzo(a)anthracene				--	
			Benzo(a)pyrene	--	2.7E-012	--	2.7E-012	Benzo(a)pyrene				--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene				--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene				--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene				--	
			Benzyl Alcohol	--		--		Benzyl Alcohol				--	
			Beryllium	--	5.2E-011	--	5.2E-011	Beryllium	respiratory		1.5E-005	--	1.5E-005
			beta-BHC	--	5.2E-013	--	5.2E-013	beta-BHC				--	
			bis(2-Chloroethyl) ether	--	3.8E-006	--	3.8E-006	bis(2-Chloroethyl) ether	liver			--	
			bis(2-Ethylhexyl)phthalate	--	3.2E-011	--	3.2E-011	bis(2-Ethylhexyl)phthalate				--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate				--	
			Cadmium	--	1.0E-009	--	1.0E-009	Cadmium				--	
			Carbon Disulfide	--		--		Carbon Disulfide			1.0E-008	--	1.0E-008
			Chlorobenzene	--		--		Chlorobenzene	liver		3.7E-002	--	3.7E-002
			Chloroform	--	6.5E-006	--	6.5E-006	Chloroform	liver		1.3E+001	--	1.3E+001
			Chromium 3+	--		--		Chromium 3+				--	
			Chromium 6+	--	1.2E-008	--	1.2E-008	Chromium 6+	respiratory			--	
			Chrysene	--		--		Chrysene				--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene				--	
			Cobalt	--		--		Cobalt				--	
			Copper	--		--		Copper				--	
			Cyanide (total)	--		--		Cyanide (total)				--	
			Dibenzofuran	--		--		Dibenzofuran				--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene				--	
			Dieldrin	--	2.4E-011	--	2.4E-011	Dieldrin				--	
			Diethylphthalate	--		--		Diethylphthalate				--	
			Dimethylphthalate	--		--		Dimethylphthalate				--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate				--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate				--	
			Endosulfan I	--		--		Endosulfan I				--	
			Endrin	--		--		Endrin				--	
			Endrin ketone	--		--		Endrin ketone				--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory		3.9E-003	--	3.9E-003
			Fluoranthene	--		--		Fluoranthene				--	
			Fluorene	--		--		Fluorene				--	
			gamma-Chlordane	--	2.6E-012	--	2.6E-012	gamma-Chlordane			5.2E-007	--	5.2E-007
			Heptachlor	--	4.2E-015	--	4.2E-015	Heptachlor				--	
			Heptachlor epoxide	--	4.1E-015	--	4.1E-015	Heptachlor epoxide				--	
			Hexachlorobenzene	--	7.1E-014	--	7.1E-014	Hexachlorobenzene	liver			--	
			Hexachlorobutadiene	--	3.4E-012	--	3.4E-012	Hexachlorobutadiene	kidney			--	
			Hexane, n-	--		--		Hexane, n-				--	

Table 6-1-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age Adult

File: Area1CT.wk4\TT\_sum RWa1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	4.2E-003	--	4.2E-003
			Mercury	--		--		Mercury	CNS	--	3.9E-006	--	3.9E-006
			Methylene Chloride	--	2.0E-006	--	2.0E-006	Methylene Chloride	respiratory	--	2.0E-002	--	2.0E-002
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	1.5E-001	--	1.5E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Phthalic anhydride	--		--		Phthalic anhydride		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	4.4E-004	--	4.4E-004
			Tetrachloroethene	--	2.6E-007	--	2.6E-007	Tetrachloroethene	liver	--	1.3E-002	--	1.3E-002
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	5.8E-002	--	5.8E-002
			Trichloroethene	--	6.5E-007	--	6.5E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	2.0E-008	--	2.0E-008	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		1.7E-005		1.7E-005	(total)			1.5E+001		1.5E+001
Total Risk Across Subsurface Soil				8.4E-004				Index Across Subsurface Soil				Total Hazard Index Across Subsurface Soil	
Total Risk Across All Media and All Exposure Routes				Reserved									

Total Kidney HI:	6.3E+000
Total Skin HI:	1.8E+001
Total Thyroid HI:	2.2E-002
Total Liver HI:	9.6E+001
Total Circulatory System HI:	3.7E+000
Total CNS HI:	1.9E-001
Total Fetotoxic HI:	3.7E-001
Total GI Tract HI:	1.4E-001
Total Respiratory HI:	7.6E-002
Total Eyes HI:	1.6E-003
Total Reproductive HI:	0.0E+000
Total Mammary HI:	2.1E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.1E-003
Total Skeletal System HI:	2.1E-003
Total Thyroid HI:	2.2E-002
Total Blood Disorders HI:	2.3E+001

Table 6-1-11  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: IND1RME.Wk4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Area 1 Fire Pond	Aluminum					Aluminum	circulatory system	6.0E-004		2.8E-003	3.4E-003
			Aroclor-1248	4.0E-007		1.9E-005	1.9E-005	Aroclor-1248	liver				
			Aroclor-1254	1.5E-006		1.1E-004	1.1E-004	Aroclor-1254	liver	1.0E-001		7.5E+000	7.6E+000
			Arsenic	9.8E-008		1.4E-006	1.5E-006	Arsenic	circulatory system	6.1E-004		8.8E-003	9.4E-003
			Barium					Barium	NA	1.2E-004		5.6E-004	6.8E-004
			Beryllium					Beryllium	kidney	2.0E-005		9.1E-003	9.1E-003
			bis(2-Ethylhexyl)phthalate	8.0E-009		3.7E-007	3.8E-007	bis(2-Ethylhexyl)phthalate	liver	8.0E-005		3.7E-003	3.8E-003
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	9.8E-008		4.5E-006	4.6E-006
			Cadmium					Cadmium	kidney	1.6E-004		3.0E-001	3.0E-001
			Chloroform	5.3E-013		2.6E-011	2.6E-011	Chloroform	circulatory system	2.4E-008		1.2E-006	1.2E-006
			Chromium (total)					Chromium (total)		8.6E-004		4.0E-002	4.1E-002
			Copper					Copper	liver	7.4E-005		5.7E-004	6.5E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	2.1E-007		9.9E-006	1.0E-005
			Iron					Iron		1.9E-003		8.9E-003	1.1E-002
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	1.3E-003		6.1E-003	7.5E-003
			Mercury					Mercury	low body weight				
			Phenol					Phenol	liver	3.9E-008		1.8E-006	1.8E-006
			Toluene					Toluene	liver	1.8E-009		8.5E-008	8.7E-008
			Vanadium					Vanadium	circulatory system	1.1E-004		5.0E-004	6.1E-004
			Zinc					Zinc	thyroid	4.6E-005		7.2E-004	7.7E-004
(Total)				2.0E-006		1.3E-004	1.3E-004	(Total)		1.1E-001		7.9E+000	8.0E+000
Total Risk Across Sediments							1.3E-004	Total Hazard Index Across All Exposure Routes					8.0E+000

Total Circulatory System HI =	1.3E-002
Total Thyroid HI =	7.7E-004
Total Kidney HI =	3.1E-001
Total Liver HI =	7.6E+000

Table 6-1-12  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: IND1CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Sediment	Sediment	Area 1 Fire Pond	Aluminum					Aluminum	circulatory system	2.6E-004		4.2E-004	6.8E-004		
			Aroclor-1248	3.5E-008		5.6E-007	6.0E-007	Aroclor-1248	liver						
			Aroclor-1254	1.3E-007		3.3E-006	3.4E-006	Aroclor-1254	liver	4.6E-002		1.1E+000	1.2E+000		
			Arsenic	8.6E-009		4.4E-008	5.2E-008	Arsenic	circulatory system	2.7E-004		1.3E-003	1.6E-003		
			Barium					Barium	NA	5.3E-005		8.5E-005	1.4E-004		
			Beryllium					Beryllium	kidney	8.6E-006		1.4E-003	1.4E-003		
			bis(2-Ethylhexyl)phthalate	7.0E-010		1.1E-008	1.2E-008	bis(2-Ethylhexyl)phthalate	liver	3.5E-005		5.6E-004	5.9E-004		
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	4.3E-008		6.9E-007	7.3E-007		
			Cadmium					Cadmium	kidney	7.0E-005		4.5E-002	4.5E-002		
			Chloroform	4.7E-014		7.8E-013	8.2E-013	Chloroform	circulatory system	1.1E-008		1.8E-007	1.9E-007		
			Chromium (total)					Chromium (total)		3.8E-004		6.0E-003	6.4E-003		
			Copper					Copper	liver	3.3E-005		8.7E-005	1.2E-004		
			Di-n-butylphthalate					Di-n-butylphthalate	liver	9.1E-008		1.5E-006	1.6E-006		
			Iron					Iron		8.4E-004		1.3E-003	2.2E-003		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	5.8E-004			5.8E-004		
			Mercury					Mercury	low body weight						
			Phenol					Phenol	liver	1.7E-008		2.7E-007	2.9E-007		
			Toluene					Toluene	liver	8.0E-010		1.3E-008	1.4E-008		
			Vanadium					Vanadium	circulatory system	4.7E-005		7.6E-005	1.2E-004		
			Zinc					Zinc	thyroid	2.0E-005		1.1E-004	1.3E-004		
(Total)				1.7E-007		3.9E-006	4.1E-006	(Total)				4.8E-002		1.2E+000	1.2E+000
Total Risk Across Sediments							4.1E-006	Total Hazard Index Across All Exposure Routes							1.2E+000

Total Circulatory System HI = 2.4E-003  
Total Thyroid HI = 1.3E-004  
Total Kidney HI = 4.7E-002  
Total Liver HI = 1.2E+000

Table 6-1-13  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: cfwkct1.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Water	Surface Water	Fire Pond Area 1	Acetone	5.1E-008		2.3E-005	2.3E-005	Acetone	fetotoxic	8.6E-005		8.7E-006	9.4E-005		
			Aluminum					Aluminum	circulatory system	1.6E-003		1.6E-004	1.8E-003		
			Ammonia					Ammonia	kidney						
			Aroclor-1248					Aroclor-1248	liver						
			Cadmium					Cadmium	kidney	2.5E-003		4.9E-003	7.4E-003		
			Chromium (total)					Chromium (total)		4.7E-002		4.7E-002	9.5E-002		
			Copper					Copper	liver	9.4E-004		1.6E-004	1.1E-003		
			Dichloroethane, 1,1-					Dichloroethane, 1,1-	circulatory system	3.4E-005		5.2E-005	8.6E-005		
			Dichloroethene, 1,2-					Dichloroethene, 1,2-	fetotoxic	1.9E-004		3.2E-004	5.1E-004		
			Iron					Iron		4.9E-003		4.9E-004	5.4E-003		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	7.1E-004		7.1E-005	7.8E-004		
			2-Butanone					2-Butanone	liver	9.4E-005		1.6E-005	1.1E-004		
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	4.3E-003			4.3E-003		
			Zinc					Zinc	thyroid	3.5E-004		7.0E-005	4.2E-004		
			(Total)	5.1E-008		2.3E-005	2.3E-005	(Total)		6.3E-002		5.4E-002	1.2E-001		
Total Risk Across Surface Water							2.3E-005	Total Hazard Index Across Surface Water							1.2E-001

Total Circulatory System HI = 1.9E-003  
Total Liver HI = 1.2E-003  
Total Kidney HI = 8.2E-003  
Total Fetotoxic HI = 4.9E-003

Total Receptor Risk Across All Media TBC

Total Receptor Hazard Index Across All Media TBC

Table 6-1-14  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: cfworkr1-NEW

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient																																			
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure																															
Water	Surface Water	Area 1 Fire Pond	Acetone	1.4E-008		7.4E-006	7.4E-006	Acetone	fetotoxic	4.7E-006		5.5E-007	5.2E-006																															
			Aluminum					Aluminum						circulatory system	9.0E-005	1.0E-005	1.0E-004																											
			Ammonia					Ammonia						kidney																														
			Aroclor-1248					Aroclor-1248						liver																														
			Cadmium					Cadmium						kidney				1.4E-004	3.1E-004	4.5E-004																								
			Chromium (total)					Chromium (total)													2.6E-003	3.0E-003	5.6E-003																					
			Copper					Copper						liver										5.2E-005	1.0E-005	6.2E-005																		
			Dichloroethane, 1,1-					Dichloroethane, 1,1-						circulatory system													1.9E-006	3.3E-006	5.2E-006															
			Dichloroethene, 1,2-					Dichloroethene, 1,2-						fetotoxic																1.0E-005	2.0E-005	3.1E-005												
			Iron					Iron																									2.7E-004	3.1E-005	3.0E-004									
			Lead					Lead						CNS																														
			Manganese					Manganese						kidney																						3.9E-005	4.5E-006	4.3E-005						
			2-Butanone					2-Butanone						liver																									5.2E-006	1.0E-006	6.2E-006			
			Nitrate/Nitrite					Nitrate/Nitrite						fetotoxic																												2.3E-004		2.3E-004
			Zinc					Zinc						thyroid																														
(Total)	(Total)		3.5E-003	3.4E-003	6.9E-003																																							
Total Risk Across Surface Water						7.4E-006	Total Hazard Index Across Surface Water				6.9E-003																																	

Total Circulatory System HI = 1.1E-004  
Total Liver HI = 6.8E-005  
Total Kidney HI = 4.9E-004  
Total Fetotoxic HI = 2.7E-004

Total Receptor Risk Across All Media TBC

Total Receptor Hazard Index Across All Media TBC

TBC = To be calculated. This value will be a total risk for Future RME Routine Workers in Area 1.

Scenario Timeframe Future  
 Receptor Population Construction Worker  
 Receptor Age: Adult

Table 6-1-15  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area1RME.wk4\TT\_sum\_ICWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 4')	1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	5.2E+000	--	6.2E+001	6.7E+001
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	2.2E-004	--	2.6E-003	2.9E-003
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	6.5E-006	--	7.9E-005	8.6E-005
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	7.4E-002	--	8.9E-001	9.6E-001
			2-Methylphenol		--			2-Methylphenol	liver	9.0E-004	--	1.1E-002	1.2E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	2.9E-003	--	3.6E-002	3.9E-002
			3,3'-Dichlorobenzidine	5.0E-009	--	6.0E-008	6.5E-008	3,3'-Dichlorobenzidine	liver		--		
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	9.2E-002	--	1.1E+000	1.2E+000
			4-Methylphenol		--			4-Methylphenol	respiratory	1.7E-002	--	3.1E-001	3.3E-001
			4,4'-DDD	4.5E-008	--	5.5E-007	5.9E-007	4,4'-DDD	liver		--		
			4,4'-DDE	2.8E-010	--	3.3E-009	3.6E-009	4,4'-DDE	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	9.0E-004	--	1.1E-002	1.2E-002
			Aluminum		--			Aluminum	circulatory	6.4E-002	--	7.7E-001	8.3E-001
			Anthracene		--			Anthracene	GI tract	7.7E-006	--	9.3E-005	1.0E-004
			Antimony		--			Antimony	skin	1.9E-001	--	2.3E+002	2.3E+002
			Aroclor-1242	4.2E-005	--	5.1E-004	5.5E-004	Aroclor-1242	liver		--		
			Aroclor-1248	7.4E-006	--	8.9E-005	9.6E-005	Aroclor-1248	liver		--		
			Aroclor-1254	1.1E-005	--	1.4E-004	1.5E-004	Aroclor-1254	liver	2.5E+001	--	3.3E+002	3.6E+002
			Aroclor-1260	1.8E-007	--	2.2E-006	2.3E-006	Aroclor-1260	circulatory		--		
			Arsenic	2.2E-007	--	2.8E-006	3.0E-006	Arsenic	circulatory	4.6E-002	--	5.8E-001	6.3E-001
			Barium		--			Barium		2.7E-002	--	3.3E-001	3.6E-001
			Benzene	1.1E-005	--	1.5E-004	1.6E-004	Benzene	blood disorders	1.2E+001	--	1.6E+002	1.7E+002
			Benzo(a)anthracene	2.3E-009	--	2.7E-008	3.0E-008	Benzo(a)anthracene			--		
			Benzo(a)pyrene	7.1E-008	--	1.0E-006	1.1E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	7.0E-009	--	8.5E-008	9.2E-008	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	7.0E-010	--	8.4E-009	9.1E-009	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	1.3E-002	--	1.5E+001	1.5E+001
			bis(2-Ethylhexyl)phthalate	1.9E-006	--	2.3E-005	2.5E-005	bis(2-Ethylhexyl)phthalate	liver	6.4E-001	--	7.7E+000	8.4E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	2.4E-002	--	2.8E-001	3.1E-001
			Cadmium		--			Cadmium	kidney	6.3E-002	--	3.0E+001	3.0E+001
			Carbon Disulfide		--			Carbon Disulfide	adrenal	9.8E-008	--	1.2E-006	1.3E-006
			Carbon Tetrachloride		--			Carbon Tetrachloride			--		
			Chlorobenzene		--			Chlorobenzene	liver	4.4E-003	--	1.7E-001	1.8E-001
			Chloroform	3.2E-007	--	4.1E-006	4.4E-006	Chloroform	circulatory	4.9E-001	--	6.2E+000	6.7E+000
			Chromium 3+		--			Chromium 3+	liver	5.9E-004	--	1.8E+000	1.8E+000
			Chrysene	2.8E-011	--	8.4E-010	8.7E-010	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	5.9E-001	--	7.1E+000	7.7E+000
			Cobalt		--			Cobalt	heart	7.6E-004	--	9.2E-003	9.9E-003
			Copper		--			Copper	liver	1.1E-002	--	2.2E-001	2.3E-001
			Cyanide (total)		--			Cyanide (total)	liver	2.1E-003	--	5.2E-002	5.4E-002
			Dibenzofuran		--			Dibenzofuran	dec growth rate	5.2E-003	--	6.2E-002	6.7E-002
			Dieldrin	2.0E-007	--	2.4E-006	2.6E-006	Dieldrin	liver	2.4E-002	--	2.8E-001	3.1E-001
			Diethylphthalate		--			Diethylphthalate	low body wt	2.7E-004	--	3.3E-003	3.5E-003
			Dimethylphthalate		--			Dimethylphthalate	GI tract	4.7E-005	--	5.7E-004	6.2E-004
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.6E-002	--	2.0E-001	2.2E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		5.9E-003	--	7.1E-002	7.7E-002
			Endrin		--			Endrin	liver	2.6E-002	--	3.2E-001	3.4E-001
			Ethyl Benzene		--			Ethyl Benzene	liver	3.3E-001	--	4.3E+000	4.6E+000
			Fluoranthene		--			Fluoranthene	kidney	4.7E-004	--	5.6E-003	6.1E-003
			Fluorene		--			Fluorene	skeletal	1.7E-003	--	2.1E-002	2.2E-002
			gamma-Chlordane	2.2E-008	--	2.7E-007	2.9E-007	gamma-Chlordane	liver	1.2E-002	--	1.4E-001	1.5E-001
			Hexachlorobenzene	5.0E-008	--	7.5E-007	8.0E-007	Hexachlorobenzene	liver	3.6E-003	--	5.5E-002	5.8E-002
			Hexachlorobutadiene	4.6E-008	--	5.5E-007	6.0E-007	Hexachlorobutadiene	low body wt	2.7E-001	--	3.3E+000	3.6E+000



Table 6-1-15  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Construction Worker  
Receptor Age: Adult

File: Area1RME.wk4\TT\_sum\_fcWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Indeno(1,2,3-cd)pyrene	7.0E-009	--	8.4E-008	9.1E-008	Indeno(1,2,3-cd)pyrene			--		
			Iron	--	--	--	--	Iron		1.2E-001	--	1.5E+000	1.6E+000
			Isophorone	3.3E-008	--	4.0E-007	4.3E-007	Isophorone	kidney	1.6E-002	--	2.0E-001	2.1E-001
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	5.7E-001	--	6.9E+000	7.5E+000
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methylene Chloride	3.0E-007	--	6.5E-006	6.8E-006	Methylene Chloride	liver	6.1E-002	--	1.3E+000	1.4E+000
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	1.4E-002	--	1.8E-001	1.9E-001
			Naphthalene	--	--	--	--	Naphthalene	circulatory	4.8E-003	--	5.8E-002	6.3E-002
			Nickel	--	--	--	--	Nickel	low body wt	2.5E-003	--	6.0E-001	6.1E-001
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	1.5E-004	--	2.0E-003	2.2E-003
			Pentachlorophenol	1.6E-007	--	2.0E-006	2.2E-006	Pentachlorophenol	liver	4.3E-003	--	5.2E-002	5.6E-002
			Phenol	--	--	--	--	Phenol	liver	4.8E-005	--	5.8E-004	6.3E-004
			Pyrene	--	--	--	--	Pyrene	liver	4.6E-004	--	5.6E-003	6.1E-003
			Selenium	--	--	--	--	Selenium	liver	6.2E-004	--	7.5E-003	8.1E-003
			Silver	--	--	--	--	Silver	skin	1.3E-003	--	7.2E-002	7.3E-002
			Styrene	--	--	--	--	Styrene	liver	1.4E-001	--	1.8E+000	1.9E+000
			Tetrachloroethene	5.5E-004	--	6.6E-003	7.2E-003	Tetrachloroethene	liver	9.8E+001	--	1.2E+003	1.3E+003
			Toluene	--	--	--	--	Toluene	liver	2.7E-002	--	3.3E-001	3.5E-001
			Trichloroethene	1.0E-008	--	1.3E-007	1.4E-007	Trichloroethene	liver	1.5E-002	--	1.8E-001	1.9E-001
			Vanadium	--	--	--	--	Vanadium	circulatory	8.2E-003	--	9.9E-002	1.1E-001
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	5.6E-003	--	7.6E-002	8.1E-002
			Zinc	--	--	--	--	Zinc	thyroid	7.2E-003	--	2.9E-001	3.0E-001
			(total)	6.2E-004	--	7.5E-003	8.2E-003	(total)		1.4E+002	--	2.1E+003	2.2E+003
	AIR	Area 1, Soil (0' to 4')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	1.0E-002	--	1.0E-002
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	3.6E-001	--	3.6E-001
			1,1,2-Trichloroethane	--	1.1E-007	--	1.1E-007	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	8.7E-008	--	8.7E-008	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	1.6E-002	--	1.6E-002
			1,2-Dichloroethane	--	1.6E-006	--	1.6E-006	1,2-Dichloroethane	circulatory	--	1.2E+000	--	1.2E+000
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	8.2E-001	--	8.2E-001
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	2.5E-004	--	2.5E-004
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	respiratory	--	6.6E-006	--	6.6E-006
			1,4-Dichlorobenzene	--	1.4E-008	--	1.4E-008	1,4-Dichlorobenzene	liver	--	2.5E-004	--	2.5E-004
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	1.9E-005	--	1.9E-005
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	1.8E-001	--	1.8E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDT	--	2.4E-010	--	2.4E-010	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Anthracene	--	--	--	--	Anthracene	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	--	--	--	--	--
			Aroclor-1242	--	9.0E-009	--	9.0E-009	Aroclor-1242	--	--	--	--	--
			Aroclor-1248	--	6.2E-009	--	6.2E-009	Aroclor-1248	--	--	--	--	--
			Aroclor-1254	--	1.0E-008	--	1.0E-008	Aroclor-1254	--	--	--	--	--

Table 6-1-15  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Construction Worker  
Receptor Age: Adult

File: Area1RME.wk4\TT\_sum\_fCWa1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Aroclor-1260	--	6.5E-009	--	6.5E-009	Aroclor-1260		--	--	--	--
			Arsenic	--	1.1E-008	--	1.1E-008	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	2.6E-002	--	2.6E-002
			Benzene	--	5.6E-006	--	5.6E-006	Benzene	blood disorders	--	1.1E+001	--	1.1E+001
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	9.3E-012	--	9.3E-012	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	1.2E-009	--	1.2E-009	Beryllium	respiratory	--	2.4E-003	--	2.4E-003
			bis(2-Chloroethyl) ether	--	6.2E-007	--	6.2E-007	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	6.8E-010	--	6.8E-010	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	1.4E-008	--	1.4E-008	Cadmium	--	--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	--	--	1.8E-006	--	1.8E-006
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	4.6E-002	--	4.6E-002
			Chloroform	--	1.5E-005	--	1.5E-005	Chloroform	liver	--	2.0E+002	--	2.0E+002
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	1.7E-007	--	1.7E-007	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Dieldrin	--	5.8E-010	--	5.8E-010	Dieldrin	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Endosulfan I	--	--	--	--	Endosulfan I	--	--	--	--	--
			Endrin	--	--	--	--	Endrin	--	--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	5.4E-002	--	5.4E-002
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			gamma-Chlordane	--	6.3E-011	--	6.3E-011	gamma-Chlordane	--	--	8.3E-005	--	8.3E-005
			Hexachlorobenzene	--	1.7E-012	--	1.7E-012	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	7.0E-011	--	7.0E-011	Hexachlorobutadiene	kidney	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Isophorone	--	--	--	--	Isophorone	--	--	--	--	--
			Lead	--	--	--	--	Lead	--	--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	6.4E-001	--	6.4E-001
			Mercury	--	--	--	--	Mercury	CNS	--	5.2E-004	--	5.2E-004
			Methylene Chloride	--	4.1E-007	--	4.1E-007	Methylene Chloride	respiratory	--	2.7E-002	--	2.7E-002
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	3.3E-001	--	3.3E-001
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride	--	--	--	--	--

Scenario	Timeframe	Future
Receptor Population	Construction Worker	
Receptor Age:	Adult	

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
			Pyrene	--		--		Pyrene		--		--		
			Selenium	--		--		Selenium		--		--		
			Silver	--		--		Silver		--		--		
			Styrene	--		--		Styrene	CNS	--	3.3E-003	--	3.3E-003	
			Tetrachloroethene	--	4.3E-007	--	4.3E-007	Tetrachloroethene	liver	--	1.4E-001	--	1.4E-001	
			Toluene	--		--		Toluene	CNS	--	3.3E-001	--	3.3E-001	
			Trichloroethene	--	9.9E-007	--	9.9E-007	Trichloroethene	respiratory	--		--		
			Vanadium	--		--		Vanadium		--		--		
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--		
			Zinc	--		--		Zinc		--		--		
				2.47E-005			2.5E-005	(total)			2.1E+002		2.1E+002	
				Total Risk Across Subsurface Soil		8.2E-003						Subsurface Soil		2.4E+003
				Total Risk Across All Media and All Exposure Routes		Reserved								

Total Kidney HI:	5.3E+001
Total Skin HI:	2.3E+002
Total Thyroid HI:	3.0E+001
Total Liver HI:	1.9E+003
total Circulatory System HI:	1.8E+001
Total CNS HI:	5.1E+001
Total Fetotoxic HI:	3.0E+001
Total GI Tract HI:	9.6E+001
Total Respiratory HI:	1.1E+000
Total Eyes HI:	1.2E+002
Total Reproductive HI:	0.0E+000
Total Mammary HI:	3.1E+001
Total Adrenal HI:	1.3E+006
Total Heart HI:	9.9E+003
Total Skeletal System HI:	2.2E+002
Total Thyroid HI:	3.0E+001
Total Blood Disorders HI:	1.7E+002

Table 6-1-16  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
Water	Surface Water	Area 1 Fire Pond	Acetone	9.2E-009		4.8E-006	4.8E-006	Acetone	fetotoxic	2.6E-005		3.0E-006	2.9E-005	
			Aluminum					circulatory system	4.9E-004	5.7E-005		5.5E-004		
			Ammonia					kidney						
			Aroclor-1248					liver						
			Cadmium					kidney	7.4E-004	1.7E-003		2.4E-003		
			Chromium (total)						1.4E-002	1.6E-002		3.1E-002		
			Copper					liver	2.8E-004	5.4E-005		3.4E-004		
			Dichloroethane, 1,1-					circulatory system	1.0E-005	1.8E-005		2.8E-005		
			Dichloroethene, 1,2-					fetotoxic	5.7E-005	1.1E-004		1.7E-004		
			Iron						1.4E-003	1.7E-004		1.6E-003		
			Lead					CNS						
			Manganese					kidney	2.1E-004	2.5E-005		2.4E-004		
			2-Butanone					liver	2.8E-005	5.6E-006		3.4E-005		
			Nitrate/Nitrite					fetotoxic	1.3E-003			1.3E-003		
			Zinc					thyroid	1.0E-004	2.4E-005		1.3E-004		
								(Total)					(Total)	
Total Risk Across Surface Water							4.8E-006							
							Total Hazard Index Across Surface Water							3.7E-002

Total Circulatory System HI =	5.8E-004
Total Liver HI =	3.7E-004
Total Kidney HI =	2.7E-003
Total Fetotoxic HI =	1.5E-003

Total Receptor Risk Across All Media TBC

Total Receptor Hazard Index Across All Media TBC

TABLE 6-1-17  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Area 1 Groundwater	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system			1.28E-002	1.28E-002
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS			1.77E-001	1.77E-001
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney			8.55E-002	8.55E-002
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	circulatory system			4.13E-002	4.13E-002
			1,4-Dichlorobenzene			8.10E-007	8.10E-007	1,4-Dichlorobenzene	GI tract			1.05E-001	1.05E-001
			2,2'-oxybis(1-Chloropropane)			6.26E-006	6.26E-006	2,2'-oxybis(1-Chloropropane)	low body wt			2.09E-001	2.09E-001
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized			4.61E-001	4.61E-001
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract			7.96E-001	7.96E-001
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver			1.44E-002	1.44E-002
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver			1.37E-003	1.37E-003
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory			1.33E+000	1.33E+000
			Aluminum					Aluminum	circulatory system			1.46E-003	1.46E-003
			Ammonia					Ammonia	kidney				
			Arochlor-1248			8.34E-004	8.34E-004	Arochlor-1248	liver				
			Arsenic			5.03E-006	5.03E-006	Arsenic	circulatory system			1.04E+000	1.04E+000
			Barium					Barium	NA			5.88E-002	5.88E-002
			Benzene			3.91E-003	3.91E-003	Benzene	blood disorders			4.20E+003	4.20E+003
			Benzoic Acid					Benzoic Acid	GI tract			1.34E-004	1.34E-004
			bis(2-Chloroethyl)Ether			2.30E-005	2.30E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			1.07E-006	1.07E-006	bis(2-Ethylhexyl)Phthalate	liver			3.58E-001	3.58E-001
			Cadmium (water)					Cadmium (water)	kidney			6.46E-001	6.46E-001
			Chlorobenzene					Chlorobenzene	liver			3.38E+000	3.38E+000
			Chloroethane			2.55E-006	2.55E-006	Chloroethane	liver			2.05E-001	2.05E-001
			Chloromethane			2.14E-007	2.14E-007	Chloromethane	kidney				
			Cyanide					Cyanide	liver			5.21E-003	5.21E-003
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA			5.47E+000	5.47E+000
			Diethylphthalate					Diethylphthalate	low body wt			3.81E-004	3.81E-004
			Ethylbenzene					Ethylbenzene	liver			4.45E+000	4.45E+000
			Iron					Iron				8.85E-001	8.85E-001
			Manganese (nonfood)					Manganese (nonfood)	kidney			1.11E+000	1.11E+000
			Methylene Chloride			3.60E-009	3.60E-009	Methylene Chloride	liver			7.47E-004	7.47E-004
			Naphthalene					Naphthalene	circulatory system			1.23E+000	1.23E+000
			Nickel					Nickel	low body wt			2.76E-002	2.76E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic				
			Phenol					Phenol	liver			1.21E-002	1.21E-002
			Selenium					Selenium	liver			6.46E-003	6.46E-003

TABLE 6-1-17  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Thallium Toluene Vanadium Vinyl Chloride Xylene (mixed) Zinc <div>(Total)</div>			1.28E-005	1.28E-005	Thallium Toluene Vanadium Vinyl Chloride Xylene (mixed) Zinc <div>(Total)</div>	NA liver circulatory system liver fetotoxic thyroid			2.68E-001 2.73E+000 1.50E-002 6.31E-001 1.77E-002 4.22E+003	2.68E-001 2.73E+000 1.50E-002 6.31E-001 1.77E-002 4.22E+003
	Air	Excavation Vapors	1,1-Dichloroethane 1,2-Dichlorobenzene 1,2-Dichloroethene(mixture) 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) 2,4-Dimethylphenol 2-Methylnaphthalene 2-Methylphenol (O-Cresol) 4-Methyl-2-Pentanone 4-Methylphenol (P-Cresol) Aluminum Ammonia Arochlor-1248 Arsenic Barium Benzene Benzoic Acid bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chlorobenzene Chloroethane Chloromethane Cyanide Di-n-Octyl Phthalate Diethylphthalate Ethylbenzene Iron		1.04E-009 1.05E-007	1.04E-009 1.05E-007	1,1-Dichloroethane 1,2-Dichlorobenzene 1,2-Dichloroethene(mixture) 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) 2,4-Dimethylphenol 2-Methylnaphthalene 2-Methylphenol (O-Cresol) 4-Methyl-2-Pentanone 4-Methylphenol (P-Cresol) Aluminum Ammonia Arochlor-1248 Arsenic Barium Benzene Benzoic Acid bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chlorobenzene Chloroethane Chloromethane Cyanide Di-n-Octyl Phthalate Diethylphthalate Ethylbenzene Iron	kidney low body weight respiratory system liver liver NA CNS NA respiratory system respiratory tract NA respiratory tract fetotoxic blood disorders liver NA respiratory tract liver fetotoxic kidney respiratory tract		7.79E-005 8.30E-003 1.93E-005 7.67E-003 1.20E+002 1.48E-003 4.73E-003	7.79E-005 8.30E-003 1.93E-005 7.67E-003 1.20E+002 1.48E-003 4.73E-003		

TABLE 6-1-17  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		2.39E-009		2.39E-009	Methylene Chloride	respiratory tract		1.57E-004		1.57E-004
			Naphthalene					Naphthalene	circulatory system		4.82E-003		4.82E-003
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					
			Toluene					Toluene	CNS		3.81E-002		3.81E-002
			Vanadium					Vanadium					
			Vinyl Chloride		6.67E-009		6.67E-009	Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
			(Total)		6.44E-005		6.44E-005	(Total)			1.20E+002		1.20E+002
				Total Risk Across Groundwater								Total Risk Across Groundwater	
				4.9E-003								4.3E+003	
				Total Risk Across All Media and All Exposure Routes									

Total Circulatory System HI =	2.3E+000
Total Liver HI =	1.1E+001
Total Kidney HI =	1.8E+000
Total Fetotoxic HI =	6.3E-001
Total Skin HI =	0.0E+000
Total GI Tract HI =	9.0E-001
Total Thyroid HI =	1.8E-002
Total Respiratory Tract HI =	1.3E+000
Total CNS HI =	2.1E-001
Total Blood Disorders HI =	4.3E+003

TABLE 6-1-18  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Worker *
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Area 1 Tap Water	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	3.56E-003		1.71E-004	3.73E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS	7.76E-003		2.56E-003	1.03E-002
			1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	2.13E-002		1.15E-003	2.25E-002
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	circulatory system	1.37E-003		6.44E-004	2.01E-003
			1,4-Dichlorobenzene	1.18E-006		4.02E-007		1,4-Dichlorobenzene	GI tract	4.57E-003		1.53E-003	6.10E-003
			2,2-Oxybis(1-Chloropropane)	1.03E-004		3.03E-006		2,2-Oxybis(1-Chloropropane)	low body wt	1.03E-001		2.96E-003	1.06E-001
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	7.54E-002		6.11E-003	8.15E-002
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	1.85E-002		1.42E-002	3.27E-002
			2-Methylphenol					2-Methylphenol	liver	3.56E-003		1.92E-004	3.75E-003
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	1.03E-003		1.83E-005	1.05E-003
			4-Methylphenol					4-Methylphenol	respiratory	2.14E-001		1.78E-002	2.31E-001
			Aluminum					Aluminum	circulatory system	3.84E-003		2.07E-005	3.86E-003
			Ammonia					Ammonia	kidney				
			Aroclor-1248			9.97E-005		Aroclor-1248	liver			0.00E+000	
			Arsenic	4.19E-004		2.43E-006		Arsenic	circulatory system	2.60E+000		1.48E-002	2.62E+000
			Barium					Barium	NA	1.55E-001		8.35E-004	1.55E-001
			Benzene	1.42E-002		1.83E-003		Benzene	blood disorders	4.57E+002		5.76E+001	5.14E+002
			Benzoic Acid					Benzoic Acid	GI tract	4.45E-005		1.76E-006	4.63E-005
			bis(2-Chloroethyl)Ether	8.62E-004		9.98E-006		bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	3.43E-007		6.24E-008		bis(2-Ethylhexyl)Phthalate	liver	3.43E-003		6.11E-004	4.04E-003
			Cadmium (water)					Cadmium (water)	kidney	8.49E-002		9.18E-003	9.41E-002
			Chlorobenzene					Chlorobenzene	liver	0.00E+000		4.70E-002	4.70E-002
			Chloroethane			1.19E-006		Chloroethane	liver	6.51E-002		2.81E-003	6.79E-002
			Chloromethane					Chloromethane	kidney				
			Cyanide (total)					Cyanide (total)	liver			7.40E-005	7.40E-005
			Di-n-octylphthalate					Di-n-octylphthalate	NA	1.44E-002		7.77E-002	9.21E-002
			Diethylphthalate					Diethylphthalate	low body wt	1.54E-004		4.00E-006	1.58E-004
			Ethyl Benzene					Ethyl Benzene	liver	1.51E-001		6.55E-002	2.16E-001
			Iron					Iron		2.33E+000		1.26E-002	2.34E+000
			Manganese (nonfood)					Manganese (nonfood)	kidney	2.95E+000		1.59E-002	2.96E+000
			Methylene Chloride					Methylene Chloride	liver	2.28E-004		1.01E-005	2.38E-004
			Naphthalene					Naphthalene	circulatory system	4.86E-002		1.81E-002	6.68E-002
			Nickel					Nickel	low body wt	3.63E-002		3.92E-004	3.67E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.33E-001			2.33E-001
			Phenol					Phenol	liver	5.48E-003		1.63E-004	5.64E-003
			Selenium					Selenium	liver	1.70E-002		9.18E-005	1.71E-002
			Thallium					Thallium	NA	7.05E-001		3.81E-003	7.08E-001
			Toluene					Toluene	liver	1.58E-001		3.83E-002	1.96E-001



Scenario Timeframe:	Current
Receptor Population:	Worker *
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Area 1 Tap Water	Vanadium					Vanadium	circulatory system	3.91E-002		2.11E-004	3.94E-002
			Vinyl Chloride Xylene (mixed) Zinc					Vinyl Chloride Xylene (mixed) Zinc	liver fetotoxic thyroid	2.06E-002 2.33E-002		9.32E-003 2.52E-004	2.99E-002 2.35E-002
	(Total)	1.55E-002		1.94E-003	1.74E-002	(Total)		4.67E+002		5.79E+001	5.24E+002		
	Air	Indoor Use Vapors	1,1-Dichloroethane					1,1-Dichloroethane	kidney		1.51E-003		1.51E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	low body weight		4.62E-002		4.62E-002
			1,2-Dichloroethene (total)					1,2-Dichloroethene (total)					
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	respiratory system		1.22E-002		1.22E-002
			1,4-Dichlorobenzene		8.43E-008			1,4-Dichlorobenzene	liver		3.56E-004		3.56E-004
			2,2-Oxybis(1-Chloropropane)		2.87E-006			2,2-Oxybis(1-Chloropropane)	liver				
			2,4-Dimethylphenol					2,4-Dimethylphenol					
			2-Methylnaphthalene					2-Methylnaphthalene					
			2-Methylphenol					2-Methylphenol	NA				
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	CNS		2.45E-003		2.45E-003
			4-Methylphenol					4-Methylphenol	NA				
			Aluminum					Aluminum	respiratory system		2.28E+000		2.28E+000
			Ammonia					Ammonia	respiratory tract		3.13E+000		3.13E+000
			Aroclor-1248		1.99E-006			Aroclor-1248	NA				
			Arsenic		3.30E-005			Arsenic	respiratory tract				
			Barium					Barium	fetotoxic		4.60E+001		4.60E+001
			Benzene			1.11E-003		Benzene	blood disorders		4.79E+002		4.79E+002
			Benzoic Acid					Benzoic Acid					
			bis(2-Chloroethyl)Ether		6.74E-005			bis(2-Chloroethyl)Ether	liver				
			bis(2-Ethylhexyl)Phthalate		2.68E-008			bis(2-Ethylhexyl)Phthalate	NA				
			Cadmium (water)		7.48E-006			Cadmium (water)	respiratory tract				
			Chlorobenzene					Chlorobenzene	liver		1.56E-001		1.56E-001
			Chloroethane					Chloroethane	fetotoxic		5.34E-003		5.34E-003
			Chloromethane					Chloromethane	kidney				
			Cyanide (total)					Cyanide (total)					
			Di-n-octylphthalate					Di-n-octylphthalate					
			Diethylphthalate					Diethylphthalate					
			Ethyl Benzene					Ethyl Benzene	respiratory tract		3.09E-002		3.09E-002
			Iron					Iron					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract		2.45E+003		2.45E+003
			Methylene Chloride					Methylene Chloride	respiratory tract		9.48E-006		9.48E-006
			Naphthalene					Naphthalene	circulatory system		6.43E-001		6.43E-001
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					

TABLE 6-1-18  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Worker *
Receptor Age:	Adult

File: c:\projects\sacs\rsk\tbls\LGovRRMEEAA.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation -	Dermal	Total Exposure
Groundwater	Air	Indoor Use Vapors	Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					
			Toluene					Toluene	CNS		1.64E-001		1.64E-001
			Vanadium					Vanadium					
			Vinyl Chloride					Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
					1.22E-003		1.22E-003				2.98E+003		2.98E+003
Total Risk Across Groundwater							1.9E-002	Total Risk Across Groundwater					3.5E+003
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI = 3.4E+000

Total Liver HI = 7.4E-002

Total Kidney HI = 3.1E+000

Total Fetotoxic HI = 2.3E-001

Total Skin HI = 0.0E+000

Total GI Tract HI = 3.9E-002

Total Thyroid HI = 2.35E-002

Total Respiratory Tract HI = 0.0E+000

Total CNS HI = 1.3E-002

Total Blood Disorders HI = 9.9E+002

TABLE 6-1-19  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Worker *
Receptor Age:	Adult

File: c:\projects\acs\skt\bl\GOVRCTAAA.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Area 1 Tap Water	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	2.24E-003		6.71E-006	2.24E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS	4.87E-003		1.00E-004	4.97E-003
			1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	1.34E-002		4.51E-005	1.34E-002
			1,3-Dichlorobenzene					1,3-Dichlorobenzene	circulatory system	8.60E-004		2.52E-005	8.85E-004
			1,4-Dichlorobenzene	1.46E-007		3.12E-009		1,4-Dichlorobenzene	GI tract	2.87E-003		5.99E-005	2.93E-003
			2,2-Oxybis(1-Chloropropane)	1.28E-005		2.35E-008		2,2-Oxybis(1-Chloropropane)	low body wt	6.45E-002		1.16E-004	6.46E-002
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	4.73E-002		2.39E-004	4.75E-002
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	1.16E-002		5.57E-004	1.22E-002
			2-Methylphenol					2-Methylphenol	liver	2.24E-003		7.54E-006	2.24E-003
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	6.45E-004		7.18E-007	6.46E-004
			4-Methylphenol					4-Methylphenol	respiratory	1.34E-001		6.96E-004	1.35E-001
			Aluminum					Aluminum	circulatory system	2.41E-003		8.12E-007	2.41E-003
			Ammonia					Ammonia	kidney				
			Aroclor-1248			7.75E-007		Aroclor-1248	liver			0.00E+000	
			Arsenic	5.22E-005		1.89E-008		Arsenic	circulatory system	1.63E+000		5.80E-004	1.63E+000
			Barium					Barium	NA	9.71E-002		3.27E-005	9.71E-002
			Benzene	1.77E-003		1.42E-005		Benzene	blood disorders	2.87E+002		2.26E+000	2.89E+002
			Benzoic Acid					Benzoic Acid	GI tract	2.80E-005		6.88E-008	2.80E-005
			bis(2-Chloroethyl)Ether	1.07E-004		7.76E-008		bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	4.27E-008		4.85E-010		bis(2-Ethylhexyl)Phthalate	liver	2.15E-003		2.39E-005	2.17E-003
			Cadmium (water)					Cadmium (water)	kidney	5.33E-002		3.60E-004	5.37E-002
			Chlorobenzene					Chlorobenzene	liver	0.00E+000		1.84E-003	1.84E-003
			Chloroethane			9.26E-009		Chloroethane	liver	4.09E-002		1.10E-004	4.10E-002
			Chloromethane					Chloromethane	kidney				
			Cyanide (total)					Cyanide (total)	liver			2.90E-006	2.90E-006
			Di-n-octylphthalate					Di-n-octylphthalate	NA	9.03E-003		3.05E-003	1.21E-002
			Diethylphthalate					Diethylphthalate	low body wt	9.68E-005		1.57E-007	9.69E-005
			Ethyl Benzene					Ethyl Benzene	liver	9.46E-002		2.57E-003	9.72E-002
			Iron					Iron		1.46E+000		4.93E-004	1.46E+000
			Manganese (nonfood)					Manganese (nonfood)	kidney	1.85E+000		6.24E-004	1.85E+000
			Methylene Chloride					Methylene Chloride	liver	1.43E-004		3.95E-007	1.44E-004
			Naphthalene					Naphthalene	circulatory system	3.05E-002		7.10E-004	3.12E-002
			Nickel					Nickel	low body wt	2.28E-002		1.54E-005	2.28E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	1.46E-001			1.46E-001
			Phenol					Phenol	liver	3.44E-003		6.38E-006	3.45E-003
			Selenium					Selenium	liver	1.07E-002		3.60E-006	1.07E-002
			Thallium					Thallium	NA	4.42E-001		1.49E-004	4.42E-001
			Toluene					Toluene	liver	9.89E-002		1.50E-003	1.00E-001

Scenario Timeframe:	Current
Receptor Population:	Worker *
Receptor Age:	Adult

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TABLE 6-1-19  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Worker *
Receptor Age:	Adult

File: c:\projects\acs\sktbls\LGVRCTAAA.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Phenol Selenium Thallium Toluene Vanadium Vinyl Chloride Xylene (mixed)					Phenol Selenium Thallium Toluene Vanadium Vinyl Chloride Xylene (mixed)	CNS   CNS CNS		1.08E-001		1.08E-001
					1.22E-003		1.22E-003				1.96E+003		1.96E+003
Total Risk Across Groundwater							3.2E-003	Total Risk Across Groundwater					2.3E+003
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	2.5E-002
Total Liver HI =	1.9E-002
Total Kidney HI =	1.9E+000
Total Fetotoxic HI =	1.5E-001
Total Skin HI =	0.0E+000
Total GI Tract HI =	1.5E-002
Total Thyroid HI =	2.35E-002
Total Respiratory Tract HI =	0.0E+000
Total CNS HI =	6.6E-003
Total Blood Disorders HI =	6.0E+002

Table 6-1-20  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area1RME wk41 TT\_sum\_Ta1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	5.6E-005	--	4.9E-003	5.0E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	2.7E-001	--	2.3E+001	2.4E+001
			1,1,2-Trichloroethane	9.8E-009	--	1.1E-006	1.1E-006	1,1,2-Trichloroethane	blood disorders	5.1E-004	--	5.6E-002	5.6E-002
			1,1,2,2-Tetrachloroethane	1.6E-008	--	2.1E-006	2.1E-006	1,1,2,2-Tetrachloroethane	liver	1.6E-005	--	2.1E-003	2.1E-003
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	7.9E-005	--	6.9E-003	7.0E-003
			1,2-Dichloroethane	7.7E-008	--	6.8E-006	6.8E-006	1,2-Dichloroethane	fetotoxic	3.4E-004	--	3.0E-002	3.0E-002
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	kidney	6.8E-003	--	6.0E-001	6.0E-001
			1,2-Dichloropropane	3.2E-008	--	2.8E-006	2.8E-006	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	1.1E-004	--	9.6E-003	9.7E-003
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	circulatory	7.4E-006	--	6.5E-004	6.6E-004
			1,4-Dichlorobenzene	2.6E-009	--	2.3E-007	2.3E-007	1,4-Dichlorobenzene	GI tract	4.4E-005	--	3.9E-003	3.9E-003
			2-Butanone	--	--	--	--	2-Butanone	liver	2.2E-004	--	2.1E-002	2.1E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	4.1E-003	--	3.6E-001	3.6E-001
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	6.2E-005	--	5.4E-003	5.5E-003
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	kidney	3.5E-004	--	3.1E-002	3.1E-002
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	1.5E-004	--	1.3E-002	1.4E-002
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	4.8E-003	--	4.2E-001	4.2E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	8.9E-004	--	1.2E-001	1.2E-001
			4,4'-DDT	5.0E-008	--	4.4E-006	4.4E-006	4,4'-DDT	fetotoxic	3.5E-003	--	3.1E-001	3.1E-001
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	4.6E-005	--	4.1E-003	4.1E-003
			Acetone	--	--	--	--	Acetone	fetotoxic	1.6E-003	--	1.8E-001	1.9E-001
			Aluminum	--	--	--	--	Aluminum	circulatory	2.1E-003	--	1.8E-001	1.9E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	9.3E-007	--	8.2E-005	8.3E-005
			Antimony	--	--	--	--	Antimony	skin	5.3E-003	--	4.7E+001	4.7E+001
			Aroclor-1242	2.2E-006	--	2.0E-004	2.0E-004	Aroclor-1242	liver	--	--	--	--
			Aroclor-1248	3.1E-006	--	2.7E-004	2.7E-004	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	4.2E-006	--	4.2E-004	4.2E-004	Aroclor-1254	liver	1.3E+000	--	1.3E+002	1.3E+002
			Aroclor-1260	9.3E-007	--	8.2E-005	8.3E-005	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	1.1E-007	--	1.0E-005	1.0E-005	Arsenic	circulatory	3.0E-003	--	2.8E-001	2.8E-001
			Barium	--	--	--	--	Barium	--	5.8E-004	--	5.1E-002	5.2E-002
			Benzene	4.1E-006	--	4.0E-004	4.0E-004	Benzene	blood disorders	5.6E-001	--	5.5E+001	5.5E+001
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	8.2E-007	--	7.3E-005	7.3E-005
			Benzo(a)anthracene	2.6E-009	--	2.3E-007	2.3E-007	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	2.8E-008	--	2.9E-006	3.0E-006	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	6.0E-009	--	5.3E-007	5.4E-007	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	6.0E-010	--	5.3E-008	5.4E-008	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	2.0E-004	--	1.7E+000	1.7E+000
			bis(2-Chloroethyl) ether	2.4E-007	--	2.1E-005	2.1E-005	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	7.7E-007	--	6.8E-005	6.8E-005	bis(2-Ethylhexyl)phthalate	liver	3.3E-002	--	2.9E+000	2.9E+000
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	6.1E-004	--	5.3E-002	5.4E-002
			Cadmium	--	--	--	--	Cadmium	kidney	3.6E-003	--	1.3E+001	1.3E+001
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	1.3E-004	--	3.6E-002	3.6E-002
			Chloroform	2.7E-007	--	2.5E-005	2.5E-005	Chloroform	circulatory	5.3E-002	--	4.9E+000	5.0E+000
			Chromium 3+	--	--	--	--	Chromium 3+	liver	1.5E-005	--	3.3E-001	3.3E-001
			Chrysene	4.0E-011	--	8.6E-009	8.7E-009	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	3.0E-002	--	2.7E+000	2.7E+000
			Cobalt	--	--	--	--	Cobalt	heart	3.1E-005	--	2.7E-003	2.8E-003
			Copper	--	--	--	--	Copper	liver	3.4E-004	--	4.9E-002	5.0E-002
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	4.7E-005	--	8.3E-003	8.4E-003
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	2.7E-004	--	2.3E-002	2.4E-002
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	7.6E-006	--	6.7E-004	6.8E-004
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	1.5E-006	--	1.3E-004	1.3E-004
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	6.3E-004	--	5.7E-002	5.8E-002

Scenario Timeframe Future  
 Receptor Population Trespasser  
 Receptor Age: Adolescent

Table 6-1-20  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area1RME.wk4\TT\_sum\_Ta1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Di-n-octylphthalate		--			Di-n-octylphthalate		1.2E-004	--	1.1E-002	1.1E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	1.7E-002	--	1.6E+000	1.6E+000
			Fluoranthene		--			Fluoranthene	kidney	2.4E-005	--	2.1E-003	2.1E-003
			Fluorene		--			Fluorene	skeletal	6.0E-005	--	5.3E-003	5.4E-003
			Hexachlorobenzene	2.0E-008	--	2.2E-006	2.2E-006	Hexachlorobenzene	liver	1.9E-004	--	2.1E-002	2.1E-002
			Hexachlorobutadiene	1.3E-008	--	1.2E-006	1.2E-006	Hexachlorobutadiene	low body wt	1.0E-002	--	8.9E-001	9.0E-001
			Iron		--			Iron		5.7E-003	--	5.0E-001	5.1E-001
			Isophorone	5.9E-009	--	5.2E-007	5.3E-007	Isophorone	kidney	3.8E-004	--	3.3E-002	3.3E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	1.4E-002	--	1.3E+000	1.3E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	9.0E-008	--	1.4E-005	1.5E-005	Methylene Chloride	liver	2.4E-003	--	3.9E-001	3.9E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	7.0E-004	--	6.8E-002	6.9E-002
			Naphthalene		--			Naphthalene	circulatory	5.9E-003	--	5.2E-001	5.2E-001
			Nickel		--			Nickel	low body wt	1.0E-004	--	1.8E-001	1.8E-001
			ortho-xylene		--			ortho-xylene	fetotoxic	1.4E-004	--	1.4E-002	1.4E-002
			Pentachlorophenol	5.0E-008	--	4.4E-006	4.4E-006	Pentachlorophenol	liver	1.7E-004	--	1.5E-002	1.5E-002
			Phenol		--			Phenol	liver	7.9E-006	--	7.0E-004	7.0E-004
			Pyrene		--			Pyrene	liver	5.0E-005	--	4.4E-003	4.4E-003
			Selenium		--			Selenium	liver	2.2E-005	--	1.9E-003	1.9E-003
			Silver		--			Silver	skin	8.5E-005	--	3.6E-002	3.6E-002
			Styrene		--			Styrene	liver	1.1E-004	--	1.0E-002	1.0E-002
			Tetrachloroethene	9.1E-006	--	8.0E-004	8.1E-004	Tetrachloroethene	liver	2.1E-001	--	1.9E+001	1.9E+001
			Toluene		--			Toluene	liver	2.5E-001	--	2.2E+001	2.3E+001
			Trichloroethene	6.5E-007	--	5.8E-005	5.9E-005	Trichloroethene	liver	1.2E-001	--	1.1E+001	1.1E+001
			Vanadium		--			Vanadium	circulatory	4.3E-004	--	3.7E-002	3.8E-002
			Xylenes (total)		--			Xylenes (total)	fetotoxic	3.2E-003	--	3.1E-001	3.1E-001
			Zinc		--			Zinc	thyroid	1.9E-004	--	5.7E-002	5.7E-002
			(total)	2.6E-005		2.4E-003	2.4E-003	(total)		2.9E+000		3.4E+002	3.4E+002
	AIR	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--		--		1,1-Dichloroethane	kidney	--	4.0E-005	--	4.0E-005
			1,1,1-Trichloroethane	--		--		1,1,1-Trichloroethane	liver	--	1.0E-003	--	1.0E-003
			1,1,2-Trichloroethane	--	7.9E-009	--	7.9E-009	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.2E-008	--	1.2E-008	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--		--		1,2-Dichlorobenzene	low body weight	--	8.3E-004	--	8.3E-004
			1,2-Dichloroethane	--	5.2E-008	--	5.2E-008	1,2-Dichloroethane	circulatory	--	4.9E-003	--	4.9E-003
			1,2-Dichloroethane (total)	--		--		1,2-Dichloroethane (total)		--	--	--	--
			1,2-Dichloropropane	--		--		1,2-Dichloropropane		--	1.2E-002	--	1.2E-002
			1,2,4-Trichlorobenzene	--		--		1,2,4-Trichlorobenzene	liver	--	4.3E-006	--	4.3E-006
			1,3-Dichlorobenzene	--		--		1,3-Dichlorobenzene	respiratory	--	1.9E-009	--	1.9E-009
			1,4-Dichlorobenzene	--	4.2E-009	--	4.2E-009	1,4-Dichlorobenzene	liver	--	1.0E-005	--	1.0E-005
			2-Butanone	--		--		2-Butanone	CNS	--	7.4E-009	--	7.4E-009
			2-Hexanone	--		--		2-Hexanone	CNS	--	5.4E-003	--	5.4E-003
			2-Methylnaphthalene	--		--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--		--		2-Methylphenol		--	--	--	--
			2,4-Dichlorophenol	--		--		2,4-Dichlorophenol		--	--	--	--
			2,4-Dimethylphenol	--		--		2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--		--		2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--		--		2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--		--		2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--		--		3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--		--		4-Methyl-2-pentanone	CNS	--	8.0E-004	--	8.0E-004
			4-Methylphenol	--		--		4-Methylphenol		--	--	--	--
			4-Nitrophenol	--		--		4-Nitrophenol		--	--	--	--

Table 6-1-20  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area1RME.wk4\TT\_sum\_Ta1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			4,4'-DDD	--		--		4,4'-DDD		--		--	
			4,4'-DDE	--		--		4,4'-DDE		--		--	
			4,4'-DDT	--	5.9E-013	--	5.9E-013	4,4'-DDT	liver	--		--	
			Acenaphthene	--		--		Acenaphthene		--		--	
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	2.7E-012	--	2.7E-012	Aldrin		--		--	
			alpha-BHC	--	5.5E-014	--	5.5E-014	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	2.2E-011	--	2.2E-011	Aroclor-1242		--		--	
			Aroclor-1248	--	1.8E-011	--	1.8E-011	Aroclor-1248		--		--	
			Aroclor-1254	--	2.7E-011	--	2.7E-011	Aroclor-1254		--		--	
			Aroclor-1260	--	3.4E-011	--	3.4E-011	Aroclor-1260		--		--	
			Arsenic	--	2.9E-011	--	2.9E-011	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--	1.1E-005	--	1.1E-005
			Benzene	--	1.3E-007	--	1.3E-007	Benzene	blood disorders	--	3.2E-002	--	3.2E-002
			Benzoic Acid	--		--		Benzoic Acid		--		--	
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	1.6E-013	--	1.6E-013	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	3.0E-012	--	3.0E-012	Beryllium	respiratory	--	7.6E-007	--	7.6E-007
			beta-BHC	--	3.0E-014	--	3.0E-014	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	2.2E-007	--	2.2E-007	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	1.8E-012	--	1.8E-012	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	5.8E-011	--	5.8E-011	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	5.2E-010	--	5.2E-010
			Chlorobenzene	--		--		Chlorobenzene	liver	--	1.8E-003	--	1.8E-003
			Chloroform	--	3.8E-007	--	3.8E-007	Chloroform	liver	--	6.5E-001	--	6.5E-001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	6.6E-010	--	6.6E-010	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Dieldrin	--	1.4E-012	--	1.4E-012	Dieldrin		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	1.9E-004	--	1.9E-004
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	



Table 6-1-20  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area1RME.wk4\1TT\_sum\_Ta1RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			gamma-Chlordane	--	1.5E-013	--	1.5E-013	gamma-Chlordane		--	2.5E-008	--	2.5E-008
			Heptachlor	--	2.4E-016	--	2.4E-016	Heptachlor		--	--	--	--
			Heptachlor epoxide	--	2.3E-016	--	2.3E-016	Heptachlor epoxide		--	--	--	--
			Hexachlorobenzene	--	4.1E-015	--	4.1E-015	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	1.9E-013	--	1.9E-013	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Isophorone	--	--	--	--	Isophorone		--	--	--	--
			Lead	--	--	--	--	Lead		--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	2.1E-004	--	2.1E-004
			Mercury	--	--	--	--	Mercury	CNS	--	1.9E-007	--	1.9E-007
			Methylene Chloride	--	1.2E-007	--	1.2E-007	Methylene Chloride	respiratory	--	9.9E-004	--	9.9E-004
			m,p-xylene	--	--	--	--	m,p-xylene		--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	7.2E-003	--	7.2E-003
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine		--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene		--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol		--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene		--	--	--	--
			Phenol	--	--	--	--	Phenol		--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride		--	--	--	--
			Pyrene	--	--	--	--	Pyrene		--	--	--	--
			Selenium	--	--	--	--	Selenium		--	--	--	--
			Silver	--	--	--	--	Silver		--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	2.2E-005	--	2.2E-005
			Tetrachloroethene	--	1.5E-008	--	1.5E-008	Tetrachloroethene	liver	--	6.5E-004	--	6.5E-004
			Thallium	--	--	--	--	Thallium		--	--	--	--
			Toluene	--	--	--	--	Toluene	CNS	--	2.9E-003	--	2.9E-003
			Trichloroethene	--	3.7E-008	--	3.7E-008	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium		--	--	--	--
			Vinyl Chloride	--	1.2E-009	--	1.2E-009	Vinyl Chloride	CNS	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc		--	--	--	--
			(total)		9.7E-007		9.7E-007	(total)			7.2E-001		7.2E-001
			Total Risk Across Subsurface Soil				2.4E-003	Total Hazard Index Across Subsurface Soil				3.4E+002	
			Total Risk Across All Media and All Exposure Routes				Reserved						

Total Kidney HI:	1.6E+001
Total Skin HI:	4.7E+001
Total Thyroid HI:	5.7E-002
Total Liver HI:	2.1E+002
Total Circulatory System HI:	8.7E+000
Total CNS HI:	1.6E-002
Total Fetotoxic HI:	9.3E-001
Total GI Tract HI:	3.7E-001
Total Respiratory HI:	1.2E-001
Total Eyes HI:	4.1E-003
Total Reproductive HI:	0.0E+000
Total Mammary HI:	5.4E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	2.8E-003
Total Skeletal System HI:	5.4E-003
Total Thyroid HI:	5.7E-002
Total Blood Disorders HI:	5.5E+001

Table 6-1-21  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age Adolescent

File: Area1CT.wk4\ITT\_sum\_TalCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	1.4E-005	--	4.2E-004	4.3E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	6.9E-002	--	2.0E+000	2.1E+000
			1,1,2-Trichloroethane	2.2E-010	--	7.7E-009	7.9E-009	1,1,2-Trichloroethane	blood disorders	1.3E-004	--	4.7E-003	4.9E-003
			1,1,2,2-Tetrachloroethane	3.7E-010	--	1.5E-008	1.5E-008	1,1,2,2-Tetrachloroethane	liver	4.3E-006	--	1.8E-004	1.8E-004
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	2.0E-005	--	5.9E-004	6.1E-004
			1,2-Dichloroethane	1.7E-009	--	4.9E-008	5.1E-008	1,2-Dichloroethane	fetotoxic	8.8E-005	--	2.5E-003	2.6E-003
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	kidney	1.8E-003	--	5.0E-002	5.2E-002
			1,2-Dichloropropane	7.0E-010	--	2.0E-008	2.1E-008	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	2.8E-005	--	8.1E-004	8.4E-004
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	circulatory	1.9E-006	--	5.6E-005	5.7E-005
			1,4-Dichlorobenzene	5.9E-011	--	1.7E-009	1.7E-009	1,4-Dichlorobenzene	GI tract	1.1E-005	--	3.3E-004	3.4E-004
			2-Butanone	--	--	--	--	2-Butanone	liver	5.8E-005	--	1.8E-003	1.8E-003
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.1E-003	--	3.0E-002	3.1E-002
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	1.6E-005	--	4.6E-004	4.8E-004
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	kidney	9.0E-005	--	2.6E-003	2.7E-003
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	3.9E-005	--	1.1E-003	1.2E-003
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	1.2E-003	--	3.6E-002	3.7E-002
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	2.3E-004	--	1.0E-002	1.1E-002
			4,4'-DDT	1.1E-009	--	3.2E-008	3.3E-008	4,4'-DDT	fetotoxic	9.1E-004	--	2.6E-002	2.7E-002
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	1.2E-005	--	3.5E-004	3.6E-004
			Acetone	--	--	--	--	Acetone	fetotoxic	4.3E-004	--	1.6E-002	1.6E-002
			Aluminum	--	--	--	--	Aluminum	circulatory	5.4E-004	--	1.6E-002	1.6E-002
			Anthracene	--	--	--	--	Anthracene	GI tract	2.4E-007	--	6.9E-006	7.2E-006
			Antimony	--	--	--	--	Antimony	skin	1.4E-003	--	3.9E+000	3.9E+000
			Aroclor-1242	4.9E-008	--	1.4E-006	1.5E-006	Aroclor-1242	liver	--	--	--	--
			Aroclor-1248	6.8E-008	--	2.0E-006	2.0E-006	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	9.4E-008	--	3.0E-006	3.1E-006	Aroclor-1254	liver	3.3E-001	--	1.1E+001	1.1E+001
			Aroclor-1260	2.1E-008	--	6.0E-007	6.2E-007	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	2.5E-009	--	7.5E-008	7.8E-008	Arsenic	circulatory	7.7E-004	--	2.3E-002	2.4E-002
			Barium	--	--	--	--	Barium	--	1.5E-004	--	4.3E-003	4.5E-003
			Benzene	9.0E-008	--	2.9E-006	3.0E-006	Benzene	blood disorders	1.4E-001	--	4.6E+000	4.8E+000
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	2.1E-007	--	6.2E-006	6.4E-006
			Benzo(a)anthracene	5.8E-011	--	1.7E-009	1.7E-009	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	6.3E-010	--	2.1E-008	2.2E-008	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	1.3E-010	--	3.9E-009	4.0E-009	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	1.3E-011	--	3.9E-010	4.0E-010	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	5.1E-005	--	1.5E-001	1.5E-001
			bis(2-Chloroethyl) ether	5.3E-009	--	1.5E-007	1.6E-007	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	1.7E-008	--	4.9E-007	5.1E-007	bis(2-Ethylhexyl)phthalate	liver	8.5E-003	--	2.5E-001	2.5E-001
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	1.6E-004	--	4.5E-003	4.7E-003
			Cadmium	--	--	--	--	Cadmium	kidney	9.3E-004	--	1.1E+000	1.1E+000
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	3.3E-005	--	3.1E-003	3.1E-003
			Chloroform	6.0E-009	--	1.8E-007	1.9E-007	Chloroform	circulatory	1.4E-002	--	4.2E-001	4.3E-001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	3.9E-006	--	2.8E-002	2.8E-002
			Chrysene	8.9E-013	--	6.3E-011	6.4E-011	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	7.9E-003	--	2.3E-001	2.4E-001
			Cobalt	--	--	--	--	Cobalt	heart	8.0E-006	--	2.3E-004	2.4E-004
			Copper	--	--	--	--	Copper	liver	8.7E-005	--	4.2E-003	4.3E-003
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	1.2E-005	--	7.1E-004	7.2E-004
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	6.9E-005	--	2.0E-003	2.1E-003
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	2.0E-006	--	5.7E-005	5.9E-005
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	3.9E-007	--	1.1E-005	1.2E-005
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	1.6E-004	--	4.9E-003	5.0E-003

Table 6-1-21  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age Adolescent

File: Area1CT, wk411T, sum, TaiCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Di-n-octylphthalate		--			Di-n-octylphthalate		3.2E-005	--	9.3E-004	9.6E-004
			Ethyl Benzene		--			Ethyl Benzene	liver	4.4E-003	--	1.4E-001	1.4E-001
			Fluoranthene		--			Fluoranthene	kidney	6.2E-006	--	1.8E-004	1.9E-004
			Fluorene		--			Fluorene	skeletal	1.6E-005	--	4.5E-004	4.7E-004
			Hexachlorobenzene	4.4E-010	--	1.6E-008	1.6E-008	Hexachlorobenzene	liver	4.8E-005	--	1.7E-003	1.8E-003
			Hexachlorobutadiene	2.9E-010	--	8.4E-009	8.7E-009	Hexachlorobutadiene	low body wt	2.6E-003	--	7.5E-002	7.8E-002
			Iron		--			Iron		1.5E-003	--	4.2E-002	4.4E-002
			Isophorone	1.3E-010	--	3.8E-009	3.9E-009	Isophorone	kidney	9.7E-005	--	2.8E-003	2.9E-003
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	3.8E-003	--	1.1E-001	1.1E-001
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	2.0E-009	--	1.1E-007	1.1E-007	Methylene Chloride	liver	6.2E-004	--	3.3E-002	3.3E-002
			m,p-xylene		--			m,p-xylene	fetotoxic	1.8E-004	--	5.8E-003	6.0E-003
			Naphthalene		--			Naphthalene	circulatory	1.5E-003	--	4.4E-002	4.5E-002
			Nickel		--			Nickel	low body wt	2.6E-005	--	1.5E-002	1.5E-002
			ortho-xylene		--			ortho-xylene	fetotoxic	3.6E-005	--	1.2E-003	1.2E-003
			Pentachlorophenol	1.1E-009	--	3.2E-008	3.3E-008	Pentachlorophenol	liver	4.3E-005	--	1.2E-003	1.3E-003
			Phenol		--			Phenol	liver	2.1E-006	--	5.9E-005	6.1E-005
			Pyrene		--			Pyrene	liver	1.3E-005	--	3.7E-004	3.9E-004
			Selenium		--			Selenium	liver	5.7E-006	--	1.6E-004	1.7E-004
			Silver		--			Silver	skin	2.2E-005	--	3.0E-003	3.0E-003
			Styrene		--			Styrene	liver	3.0E-005	--	8.5E-004	8.8E-004
			Tetrachloroethene	2.0E-007	--	5.8E-006	6.0E-006	Tetrachloroethene	liver	5.5E-002	--	1.6E+000	1.6E+000
			Toluene		--			Toluene	liver	6.6E-002	--	1.9E+000	2.0E+000
			Trichloroethene	1.4E-008	--	4.3E-007	4.4E-007	Trichloroethene	liver	3.1E-002	--	9.0E-001	9.3E-001
			Vanadium		--			Vanadium	circulatory	1.1E-004	--	3.2E-003	3.3E-003
			Xylenes (total)		--			Xylenes (total)	fetotoxic	8.2E-004	--	2.6E-002	2.7E-002
			Zinc		--			Zinc	thyroid	5.0E-005	--	4.8E-003	4.9E-003
			(total)	5.8E-007	--	1.7E-005	1.8E-005	(total)		7.5E-001	--	2.8E+001	2.9E+001
AIR	Area 1, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--		1,1-Dichloroethane	kidney	--	1.0E-005	--	1.0E-005
		1,1,1-Trichloroethane	--	--	--	--		1,1,1-Trichloroethane	liver	--	2.7E-004	--	2.7E-004
		1,1,2-Trichloroethane	--	1.8E-010	--	--	1.8E-010	1,1,2-Trichloroethane	liver	--	--	--	--
		1,1,2,2-Tetrachloroethane	--	2.7E-010	--	--	2.7E-010	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
		1,2-Dichlorobenzene	--	--	--	--		1,2-Dichlorobenzene	low body weight	--	2.2E-004	--	2.2E-004
		1,2-Dichloroethane	--	1.2E-009	--	--	1.2E-009	1,2-Dichloroethane	circulatory	--	1.3E-003	--	1.3E-003
		1,2-Dichloroethane (total)	--	--	--	--		1,2-Dichloroethane (total)		--	--	--	--
		1,2-Dichloropropane	--	--	--	--		1,2-Dichloropropane		--	3.1E-003	--	3.1E-003
		1,2,4-Trichlorobenzene	--	--	--	--		1,2,4-Trichlorobenzene	liver	--	1.1E-006	--	1.1E-006
		1,3-Dichlorobenzene	--	--	--	--		1,3-Dichlorobenzene	respiratory	--	4.8E-010	--	4.8E-010
		1,4-Dichlorobenzene	--	9.4E-011	--	--	9.4E-011	1,4-Dichlorobenzene	liver	--	2.6E-006	--	2.6E-006
		2-Butanone	--	--	--	--		2-Butanone	CNS	--	1.9E-009	--	1.9E-009
		2-Hexanone	--	--	--	--		2-Hexanone	CNS	--	1.4E-003	--	1.4E-003
		2-Methylnaphthalene	--	--	--	--		2-Methylnaphthalene		--	--	--	--
		2-Methylphenol	--	--	--	--		2-Methylphenol		--	--	--	--
		2,4-Dichlorophenol	--	--	--	--		2,4-Dichlorophenol		--	--	--	--
		2,4-Dimethylphenol	--	--	--	--		2,4-Dimethylphenol		--	--	--	--
		2,4-Dinitrotoluene	--	--	--	--		2,4-Dinitrotoluene		--	--	--	--
		2,4,5-Trichlorophenol	--	--	--	--		2,4,5-Trichlorophenol		--	--	--	--
		2,6-Dinitrotoluene	--	--	--	--		2,6-Dinitrotoluene		--	--	--	--
		3,3'-Dichlorobenzidine	--	--	--	--		3,3'-Dichlorobenzidine		--	--	--	--
		4-Methyl-2-pentanone	--	--	--	--		4-Methyl-2-pentanone	CNS	--	2.1E-004	--	2.1E-004
		4-Methylphenol	--	--	--	--		4-Methylphenol		--	--	--	--

Table 6-1-21  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area1CT\_wk4\TT\_sum\_Ta1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			4-Nitrophenol	--		--		4-Nitrophenol		--		--	
			4,4'-DDD	--		--		4,4'-DDD		--		--	
			4,4'-DDE	--		--		4,4'-DDE		--		--	
			4,4'-DDT	--	1.3E-014	--	1.3E-014	4,4'-DDT	liver	--		--	
			Acenaphthene	--		--		Acenaphthene		--		--	
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	6.0E-014	--	6.0E-014	Aldrin		--		--	
			alpha-BHC	--	1.2E-015	--	1.2E-015	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	4.9E-013	--	4.9E-013	Aroclor-1242		--		--	
			Aroclor-1248	--	3.9E-013	--	3.9E-013	Aroclor-1248		--		--	
			Aroclor-1254	--	6.0E-013	--	6.0E-013	Aroclor-1254		--		--	
			Aroclor-1260	--	7.5E-013	--	7.5E-013	Aroclor-1260		--		--	
			Arsenic	--	6.4E-013	--	6.4E-013	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--		--	
			Benzene	--	2.9E-009	--	2.9E-009	Benzene	blood disorders	--	2.9E-006	--	2.9E-006
			Benzoic Acid	--		--		Benzoic Acid		--	8.2E-003	--	8.2E-003
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	3.5E-015	--	3.5E-015	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	6.7E-014	--	6.7E-014	Beryllium	respiratory	--	2.0E-007	--	2.0E-007
			beta-BHC	--	6.7E-016	--	6.7E-016	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	4.8E-009	--	4.8E-009	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	4.1E-014	--	4.1E-014	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	1.3E-012	--	1.3E-012	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	1.3E-010	--	1.3E-010
			Chlorobenzene	--		--		Chlorobenzene	liver	--	4.7E-004	--	4.7E-004
			Chloroform	--	8.4E-009	--	8.4E-009	Chloroform	liver	--	1.7E-001	--	1.7E-001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	1.5E-011	--	1.5E-011	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Dieldrin	--	3.0E-014	--	3.0E-014	Dieldrin		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	5.0E-005	--	5.0E-005
			Fluoranthene	--		--		Fluoranthene		--		--	

Table 6-1-21  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age Adolescent

File: Area1CT.wkd\11T\_sum\_Tot1CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Fluorene	--	--	--	--	Fluorene		--	--	--	--
			gamma-Chlordane	--	3.3E-015	--	3.3E-015	gamma-Chlordane		--	6.6E-009	--	6.6E-009
			Heptachlor	--	5.4E-018	--	5.4E-018	Heptachlor		--	--	--	--
			Heptachlor epoxide	--	5.2E-018	--	5.2E-018	Heptachlor epoxide		--	--	--	--
			Hexachlorobenzene	--	9.1E-017	--	9.1E-017	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	4.3E-015	--	4.3E-015	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Isophorone	--	--	--	--	Isophorone		--	--	--	--
			Lead	--	--	--	--	Lead		--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	5.4E-005	--	5.4E-005
			Mercury	--	--	--	--	Mercury	CNS	--	5.0E-008	--	5.0E-008
			Methylene Chloride	--	2.6E-009	--	2.6E-009	Methylene Chloride	respiratory	--	2.6E-004	--	2.6E-004
			m,p-xylene	--	--	--	--	m,p-xylene		--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	1.9E-003	--	1.9E-003
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine		--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene		--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol		--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene		--	--	--	--
			Phenol	--	--	--	--	Phenol		--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride		--	--	--	--
			Pyrene	--	--	--	--	Pyrene		--	--	--	--
			Selenium	--	--	--	--	Selenium		--	--	--	--
			Silver	--	--	--	--	Silver		--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	5.7E-006	--	5.7E-006
			Tetrachloroethene	--	3.4E-010	--	3.4E-010	Tetrachloroethene	liver	--	1.7E-004	--	1.7E-004
			Thallium	--	--	--	--	Thallium		--	--	--	--
			Toluene	--	--	--	--	Toluene	CNS	--	7.4E-004	--	7.4E-004
			Trichloroethene	--	8.3E-010	--	8.3E-010	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium		--	--	--	--
			Vinyl Chloride	--	2.6E-011	--	2.6E-011	Vinyl Chloride	CNS	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc		--	--	--	--
			(total)		2.2E-008		2.2E-008	(total)			1.9E-001		1.9E-001

Total Risk Across Subsurface Soil 1.8E-005  
Total Risk Across All Media and All Exposure Routes Reserved

Total Hazard Index Across Subsurface Soil 2.9E+001

Total Kidney HI:	1.4E+000
Total Skin HI:	4.0E+000
Total Thyroid HI:	4.9E-003
Total Liver HI:	1.8E+001
Total Circulatory System HI:	7.6E-001
Total CNS HI:	3.0E-003
Total Fetotoxic HI:	8.0E-002
Total GI Tract HI:	3.2E-002
Total Respiratory HI:	1.1E-002
Total Eyes HI:	3.6E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	4.7E-003
Total Adrenal HI:	0.0E+000
Total Heart HI:	2.4E-004
Total Skeletal System HI:	4.7E-004
Total Thyroid HI:	4.9E-003
Total Blood Disorders HI:	4.8E+000

Table 6-1-22  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS1RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Fire Pond Area 1	Aluminum					Aluminum	circulatory system	2.5E-003		1.1E-003	3.6E-003
			Aroclor-1248	3.9E-007		1.7E-006	2.1E-006	Aroclor-1248	liver				
			Aroclor-1254	1.4E-006		9.9E-006	1.1E-005	Aroclor-1254	liver	4.3E-001		3.0E+000	3.4E+000
			Arsenic	9.5E-008		1.3E-007	2.3E-007	Arsenic	circulatory system	2.5E-003		3.5E-003	6.0E-003
			Barium					Barium	NA	5.0E-004		2.2E-004	7.2E-004
			Beryllium					Beryllium	kidney	8.1E-005		3.6E-003	3.7E-003
			bis(2-Ethylhexyl)phthalate	7.7E-009		3.4E-008	4.2E-008	bis(2-Ethylhexyl)phthalate	liver	3.3E-004		1.5E-003	1.8E-003
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	4.1E-007		1.8E-006	2.2E-006
			Cadmium					Cadmium	kidney	6.6E-004		1.2E-001	1.2E-001
			Chloroform	5.2E-013		2.4E-012	2.9E-012	Chloroform	circulatory system	1.0E-007		4.7E-007	5.7E-007
			Chromium (total)					Chromium (total)		3.6E-003		1.6E-002	1.9E-002
			Copper					Copper	liver	3.1E-004		2.3E-004	5.3E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	8.6E-007		3.9E-006	4.8E-006
			Iron					Iron		7.9E-003		3.5E-003	1.1E-002
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	5.5E-003			5.5E-003
			Mercury					Mercury	low body weight				
			Phenol					Phenol	liver	1.6E-007		7.1E-007	8.7E-007
			Toluene					Toluene	liver	7.6E-009		3.3E-008	4.1E-008
			Vanadium					Vanadium	circulatory system	4.5E-004		2.0E-004	6.5E-004
			Zinc					Zinc	thyroid	1.9E-004		2.8E-004	4.8E-004
						(Total)	1.9E-006		1.2E-005	1.4E-005	(Total)		4.6E-001
Total Risk Across Sediments							1.4E-005	Total Hazard Index Across All Exposure Routes					3.6E+000

Total Circulatory System HI =	1.0E-002
Total Thyroid HI =	4.8E-004
Total Kidney HI =	1.3E-001
Total Liver HI =	3.4E+000

Table 6-1-23  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS1CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Fire Pond Area 1	Aluminum					Aluminum	circulatory system	6.4E-004		9.2E-005	7.3E-004
			Aroclor-1248	8.6E-009		1.2E-008	2.1E-008	Aroclor-1248	liver				
			Aroclor-1254	3.2E-008		7.2E-008	1.0E-007	Aroclor-1254	liver	1.1E-001		2.5E-001	3.6E-001
			Arsenic	2.1E-009		9.6E-010	3.1E-009	Arsenic	circulatory system	6.6E-004		2.9E-004	9.5E-004
			Barium					Barium	NA	1.3E-004		1.9E-005	1.5E-004
			Beryllium					Beryllium	kidney	2.1E-005		3.0E-004	3.2E-004
			bis(2-Ethylhexyl)phthalate	1.7E-010		2.5E-010	4.2E-010	bis(2-Ethylhexyl)phthalate	liver	8.5E-005		1.2E-004	2.1E-004
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	1.0E-007		1.5E-007	2.6E-007
			Cadmium					Cadmium	kidney	1.7E-004		9.8E-003	1.0E-002
			Chloroform	1.1E-014		1.7E-014	2.9E-014	Chloroform	circulatory system	2.6E-008		3.9E-008	6.6E-008
			Chromium (total)					Chromium (total)		9.2E-004		1.3E-003	2.2E-003
			Copper					Copper	liver	8.0E-005		1.9E-005	9.9E-005
			Di-n-butylphthalate					Di-n-butylphthalate	liver	2.2E-007		3.3E-007	5.5E-007
			Iron					Iron		2.1E-003		3.0E-004	2.3E-003
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	1.4E-003			1.4E-003
			Mercury					Mercury	low body weight				
			Phenol					Phenol	liver	4.2E-008		6.0E-008	1.0E-007
			Toluene					Toluene	liver	2.0E-009		2.8E-009	4.8E-009
			Vanadium					Vanadium	circulatory system	1.2E-004		1.7E-005	1.3E-004
			Zinc					Zinc	thyroid	5.0E-005		2.4E-005	7.4E-005
			(Total)	4.3E-008		8.6E-008	1.3E-007	(Total)	1.2E-001		2.6E-001	3.8E-001	
Total Risk Across Sediments							1.3E-007	Total Hazard Index Across All Exposure Routes					3.8E-001

Total Circulatory System HI =	1.8E-003
Total Thyroid HI =	7.4E-005
Total Kidney HI =	1.2E-002
Total Liver HI =	3.6E-001

Table 6-1-24  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: FTRESA1A.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Water	Surface Water	Fire Pond Area 1	Acetone	1.8E-008		5.2E-006	5.2E-006	Acetone	fetotoxic	6.6E-006		5.0E-007	7.1E-006
			Aluminum					Aluminum	circulatory system	1.3E-004		1.1E-005	1.4E-004
			Ammonia					Ammonia	kidney				
			Aroclor-1248					Aroclor-1248	liver				
			Cadmium					Cadmium	kidney	1.9E-004		3.3E-004	5.2E-004
			Chromium (total)					Chromium (total)		3.6E-003		3.2E-003	6.8E-003
			Copper					Copper	liver	7.2E-005		1.1E-005	8.3E-005
			Dichloroethane, 1,1-					Dichloroethane, 1,1-	circulatory system	2.6E-006		2.8E-006	5.4E-006
			Dichloroethene, 1,2-					Dichloroethene, 1,2-	fetotoxic	1.5E-005		1.7E-005	3.2E-005
			Iron					Iron		3.7E-004		3.3E-005	4.1E-004
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	5.4E-005		4.8E-006	5.9E-005
			2-Butanone					2-Butanone	liver	7.2E-006		9.1E-007	8.1E-006
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	3.3E-004			3.3E-004
			Zinc					Zinc	thyroid	2.7E-005		4.7E-006	3.1E-005
			(Total)	1.8E-008		5.2E-006	5.2E-006	(Total)		4.8E-003		3.6E-003	8.5E-003
Total Risk Across Surface Water				5.2E-006				Total Hazard Index Across Surface Water				8.5E-003	

Total Circulatory System HI =	1.4E-004
Total Liver HI =	9.1E-005
Total Kidney HI =	5.8E-004
Total Fetotoxic HI =	3.7E-004

Total Receptor Risk Across All Media TBC

Total Receptor Hazard Index Across All Media TBC



Table 6-1-25  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: TRESA1CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Water	Surface Water	Fire Pond Area 1	Acetone	3.9E-010		1.3E-007	1.3E-007	Acetone	fetotoxic	1.6E-006		1.2E-007	1.8E-006
			Aluminum					circulatory system	3.1E-005		2.3E-006	3.4E-005	
			Ammonia					kidney					
			Aroclor-1248					liver					
			Cadmium					kidney	4.7E-005		6.8E-005	1.2E-004	
			Chromium (total)						9.1E-004		6.5E-004	1.6E-003	
			Copper					liver	1.8E-005		2.2E-006	2.0E-005	
			Dichloroethane, 1,1-					circulatory system	6.6E-007		7.2E-007	1.4E-006	
			Dichloroethene, 1,2-					fetotoxic	3.6E-006		4.4E-006	8.1E-006	
			Iron						9.3E-005		6.7E-006	1.0E-004	
			Lead					CNS					
			Manganese					kidney	1.4E-005		9.8E-007	1.5E-005	
			2-Butanone					liver	1.8E-006		2.2E-007	2.0E-006	
			Nitrate/Nitrite					fetotoxic	8.2E-005			8.2E-005	
			Zinc					thyroid	6.7E-006		9.6E-007	7.6E-006	
			(Total)	3.9E-010		1.3E-007	(Total)		1.2E-003		7.4E-004	1.9E-003	
Total Risk Across Surface Water							1.3E-007	Total Hazard Index Across Surface Water					1.9E-003

Total Circulatory System HI = 3.5E-005  
Total Liver HI = 2.2E-005  
Total Kidney HI = 1.3E-004  
Total Fetotoxic HI = 9.2E-005

Total Receptor Risk Across All Media TBC

Total Receptor Hazard Index Across All Media TBC

= To be calculated. This value will be a total risk for Future CT Trespassers in Area 1.

Table 6-2-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: Area2RME.wk4\TT\_sum\_IUWa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	1.5E-004	--	7.4E-003	7.5E-003
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	3.7E-003	--	1.8E-001	1.9E-001
			1,1,2,2-Tetrachloroethane	2.9E-009	--	2.1E-007	2.1E-007	1,1,2,2-Tetrachloroethane	liver	6.8E-007	--	4.9E-005	4.9E-005
			1,2-Dichlorobenzene	6.8E-007	--	3.3E-005	3.4E-005	1,2-Dichlorobenzene	CNS	2.6E-003	--	1.3E-001	1.4E-001
			1,2-Dichloroethane		--			1,2-Dichloroethane	fetotoxic	6.8E-004	--	3.4E-002	3.5E-002
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	4.3E-003	--	2.1E-001	2.2E-001
			1,2-Dichloropropane	7.4E-008	--	3.7E-006	3.8E-006	1,2-Dichloropropane	GI tract		--		
			1,2,4-Trichlorobenzene		--			1,2,4-Trichlorobenzene	low body wt	1.1E-003	--	5.7E-002	5.8E-002
			1,4-Dichlorobenzene	8.8E-009	--	4.4E-007	4.5E-007	1,4-Dichlorobenzene	GI tract	3.4E-005	--	1.7E-003	1.8E-003
			2-Butanone		--			2-Butanone	liver	8.5E-003	--	4.5E-001	4.6E-001
			2-Hexanone		--			2-Hexanone	CNS	2.6E-003	--	1.3E-001	1.3E-001
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	2.9E-002	--	1.5E+000	1.5E+000
			2-Methylphenol		--			2-Methylphenol	liver	2.7E-003	--	1.4E-001	1.4E-001
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	5.0E-003	--	2.5E-001	2.5E-001
			2,6-Dinitrotoluene		--			2,6-Dinitrotoluene			--		
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	5.1E-003	--	2.6E-001	2.6E-001
			4-Methylphenol		--			4-Methylphenol	respiratory	4.1E-002	--	3.1E+000	3.2E+000
			4,4'-DDD	3.2E-007	--	1.6E-005	1.6E-005	4,4'-DDD	liver		--		
			4,4'-DDE	1.2E-007	--	6.1E-006	6.2E-006	4,4'-DDE	liver		--		
			4,4'-DDT	2.3E-007	--	1.2E-005	1.2E-005	4,4'-DDT	fetotoxic	3.8E-003	--	1.9E-001	2.0E-001
			Acenaphthene		--			Acenaphthene	eyes	2.6E-004	--	1.4E-002	1.4E-002
			Acetone		--			Acetone	fetotoxic	1.4E-002	--	8.7E-001	8.8E-001
			Aldrin	5.3E-005	--	2.7E-003	2.7E-003	Aldrin	liver	2.9E-001	--	1.5E+001	1.5E+001
			alpha-BHC	8.4E-007	--	4.2E-005	4.3E-005	alpha-BHC	liver		--		
			Aluminum		--			Aluminum	circulatory	9.3E-003	--	4.7E-001	4.8E-001
			Anthracene		--			Anthracene	GI tract	4.9E-006	--	2.5E-004	2.5E-004
			Antimony		--			Antimony	skin	4.6E-001	--	2.3E+003	2.3E+003
			Aroclor-1248		--			Aroclor-1248	liver		--		
			Aroclor-1254	2.9E-005	--	1.6E-003	1.7E-003	Aroclor-1254	liver	2.0E+000	--	1.1E+002	1.2E+002
			Aroclor-1260	2.7E-003	--	1.4E-001	1.4E-001	Aroclor-1260	circulatory		--		
			Arsenic	4.7E-006	--	2.5E-004	2.5E-004	Arsenic	circulatory	2.9E-002	--	1.5E+000	1.6E+000
			Barium		--			Barium		4.3E-002	--	2.2E+000	2.2E+000
			Benzene	1.1E-006	--	6.3E-005	6.4E-005	Benzene	blood disorders	3.6E-002	--	2.0E+000	2.1E+000
			Benzoic Acid		--			Benzoic Acid	GI tract	6.8E-005	--	3.4E-003	3.5E-003
			Benzo(a)anthracene	7.9E-007	--	4.0E-005	4.1E-005	Benzo(a)anthracene			--		
			Benzo(a)pyrene	4.4E-006	--	2.6E-004	2.7E-004	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.6E-006	--	7.8E-005	8.0E-005	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.6E-007	--	7.8E-006	8.0E-006	Benzo(k)fluoranthene			--		
			Benzyl Alcohol		--			Benzyl Alcohol	CNS	1.3E-004	--	6.4E-003	6.6E-003
			Beryllium		--			Beryllium	kidney	1.9E-004	--	9.6E-001	9.6E-001
			beta-BHC	5.8E-007	--	2.9E-005	3.0E-005	beta-BHC	liver		--		
			bis(2-Chloroethyl) ether	4.9E-005	--	2.5E-003	2.5E-003	bis(2-Chloroethyl) ether	reproductive		--		
			bis(2-Ethylhexyl)phthalate	1.3E-005	--	8.5E-004	8.7E-004	bis(2-Ethylhexyl)phthalate	liver	1.3E-001	--	6.5E+000	6.7E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	2.4E-003	--	1.2E-001	1.2E-001
			Cadmium		--			Cadmium	kidney	1.2E-001	--	2.4E+002	2.4E+002
			Chloroform	3.4E-007	--	1.8E-005	1.8E-005	Chloroform	circulatory	1.6E-002	--	8.3E-001	8.5E-001
			Chromium 3+		--			Chromium 3+	liver	1.1E-003	--	1.4E+001	1.4E+001
			Chrysene	1.1E-008	--	1.4E-006	1.4E-006	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	2.6E-005	--	1.3E-003	1.3E-003
			Cobalt		--			Cobalt	heart	8.2E-004	--	3.1E-002	3.2E-002
			Copper		--			Copper	liver	3.7E-002	--	3.1E+000	3.2E+000
			Dibenzofuran		--			Dibenzofuran	dec growth rate	7.0E-004	--	3.5E-002	3.6E-002
			Diethylphthalate		--			Diethylphthalate	low body wt	9.0E-005	--	4.5E-003	4.6E-003
			Dimethylphthalate		--			Dimethylphthalate	GI tract	2.9E-005	--	1.5E-003	1.5E-003
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	4.4E-003	--	2.3E-001	2.3E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		7.3E-004	--	3.7E-002	3.8E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	7.7E-003	--	4.2E-001	4.3E-001
			Fluoranthene		--			Fluoranthene	kidney	1.2E-004	--	5.8E-003	5.9E-003
			Fluorene		--			Fluorene	skeletal	5.1E-004	--	2.6E-002	2.6E-002
			Hexachlorobutadiene	2.9E-008	--	1.5E-006	1.5E-006	Hexachlorobutadiene	low body wt	5.2E-003	--	2.6E-001	2.7E-001

Table 6-2-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe	Current/Future
Receptor Population	Utility Worker
Receptor Age	Adult

File: Area2RME.wk4\TT\_sum\_IUWa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Indeno(1,2,3-cd)pyrene	4.1E-007	--	2.1E-005	2.1E-005	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		7.2E-002	--	3.6E+000	3.7E+000
			Isophorone	6.9E-007	--	3.5E-005	3.5E-005	Isophorone	kidney	1.0E-002	--	5.1E-001	5.2E-001
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	2.3E-002	--	1.1E+000	1.2E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	2.1E-007	--	1.9E-005	1.9E-005	Methylene Chloride	liver	1.3E-003	--	1.2E-001	1.2E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	2.8E-006	--	1.5E-004	1.6E-004
			Naphthalene		--			Naphthalene	circulatory	2.8E-002	--	1.4E+000	1.4E+000
			Nickel		--			Nickel	low body wt	3.1E-003	--	3.1E+000	3.1E+000
			ortho-xylene		--			ortho-xylene	fetotoxic	1.4E-008	--	7.9E-005	8.0E-005
			Pentachlorophenol	3.0E-006	--	1.5E-004	1.6E-004	Pentachlorophenol	liver	2.4E-003	--	1.2E-001	1.2E-001
			Phenol		--			Phenol	liver	3.2E-004	--	1.6E-002	1.6E-002
			Pyrene		--			Pyrene	liver	3.0E-004	--	1.5E-002	1.5E-002
			Selenium		--			Selenium	liver	1.9E-003	--	9.4E-002	9.6E-002
			Silver		--			Silver	skin	7.9E-003	--	1.9E+000	1.9E+000
			Styrene		--			Styrene	liver	2.9E-004	--	1.5E-002	1.5E-002
			Tetrachloroethene	1.8E-005	--	9.3E-004	9.5E-004	Tetrachloroethene	liver	9.9E-002	--	5.0E+000	5.1E+000
			Thallium		--			Thallium		2.3E-002	--	1.2E+000	1.2E+000
			Toluene		--			Toluene	liver	7.3E-003	--	3.7E-001	3.8E-001
			Trichloroethene	1.5E-006	--	8.0E-005	8.1E-005	Trichloroethene	liver	6.6E-002	--	3.4E+000	3.4E+000
			Vanadium		--			Vanadium	circulatory	2.0E-003	--	9.9E-002	1.0E-001
			Vinyl Chloride	8.4E-008	--	4.2E-006	4.3E-008	Vinyl Chloride	liver	3.1E-002	--	5.2E+000	5.3E+000
			Xylenes (total)		--			Xylenes (total)	fetotoxic	2.0E-003	--	1.1E-001	1.2E-001
			Zinc		--			Zinc	thyroid	3.1E-002	--	5.2E+000	5.3E+000
			(total)	3.2E-003		1.6E-001	1.6E-001	(total)		3.7E+000		2.8E+003	2.8E+003
	AIR	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	5.1E-003	--	5.1E-003
			1,1-Dichloroethene	--	--	--		1,1-Dichloroethene		--	--	--	
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	3.0E-003	--	3.0E-003
			1,1,2-Trichloroethane	--	6.9E-008	--	6.9E-008	1,1,2-Trichloroethane	liver	--	--	--	
			1,1,2,2-Tetrachloroethane	--	2.4E-008	--	2.4E-008	1,1,2,2-Tetrachloroethane	liver	--	--	--	
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	5.4E-002	--	5.4E-002
			1,2-Dichloroethane	--	7.9E-006	--	7.9E-006	1,2-Dichloroethane	circulatory	--	1.7E-001	--	1.7E-001
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	9.2E-002	--	9.2E-002
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	4.9E-004	--	4.9E-004
			1,4-Dichlorobenzene	--	7.2E-008	--	7.2E-008	1,4-Dichlorobenzene	liver	--	4.0E-005	--	4.0E-005
			2-Butanone	--	--	--		2-Butanone	CNS	--	8.4E-004	--	8.4E-004
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	1.6E+000	--	1.6E+000
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	3.2E-002	--	3.2E-002
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	
			4,4'-DDT	--	1.3E-008	--	1.3E-008	4,4'-DDT	liver	--	--	--	
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	
			Acetone	--	--	--		Acetone		--	--	--	
			Aldrin	--	2.9E-006	--	2.9E-006	Aldrin		--	--	--	
			alpha-BHC	--	4.8E-008	--	4.8E-008	alpha-BHC		--	--	--	
			Anthracene	--	--	--		Anthracene		--	--	--	
			Antimony	--	--	--		Antimony		--	--	--	
			Aroclor-1242	--	3.2E-007	--	3.2E-007	Aroclor-1242		--	--	--	
			Aroclor-1248	--	1.3E-005	--	1.3E-005	Aroclor-1248		--	--	--	
			Aroclor-1254	--	1.7E-006	--	1.7E-006	Aroclor-1254		--	--	--	
			Aroclor-1260	--	1.3E-004	--	1.3E-004	Aroclor-1260		--	--	--	
			Arsenic	--	2.5E-008	--	2.5E-006	Arsenic	respiratory	--	--	--	
			Barium	--	--	--		Barium	fetotoxic	--	1.1E+000	--	1.1E+000

Table 6-2-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: Area2RME.w4A1TT\_sum\_IUWa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Benzene	--	8.1E-006	--	8.1E-006	Benzene	blood disorders	--	4.6E-001	--	4.6E-001
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	1.1E-007	--	1.1E-007	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	--	--	--	--	--
			Beryllium	--	6.5E-008	--	6.5E-008	Beryllium	respiratory	--	3.8E-003	--	3.8E-003
			beta-BHC	--	3.2E-008	--	3.2E-008	beta-BHC	--	--	--	--	--
			bis(2-Chloroethyl) ether	--	3.7E-005	--	3.7E-005	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	6.2E-007	--	6.2E-007	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	1.6E-005	--	1.6E-005	Cadmium	--	--	--	--	--
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	2.6E-004	--	2.6E-004
			Chloroform	--	2.9E-005	--	2.9E-005	Chloroform	liver	--	1.2E+001	--	1.2E+001
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	2.0E-004	--	2.0E-004	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Dibenzo(a,h)anthracene	--	--	--	--	Dibenzo(a,h)anthracene	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	1.3E-002	--	1.3E-002
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			Hexachlorobenzene	--	2.8E-008	--	2.8E-008	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	9.2E-008	--	9.2E-008	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Isophorone	--	--	--	--	Isophorone	--	--	--	--	--
			Lead	--	--	--	--	Lead	--	--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	1.7E+000	--	1.7E+000
			Mercury	--	--	--	--	Mercury	CNS	--	6.0E-003	--	6.0E-003
			Methylene Chloride	--	5.4E-007	--	5.4E-007	Methylene Chloride	respiratory	--	1.1E-003	--	1.1E-003
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	2.9E-001	--	2.9E-001
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--
			Silver	--	--	--	--	Silver	--	--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	3.4E-004	--	3.4E-004
			Tetrachloroethene	--	4.9E-006	--	4.9E-006	Tetrachloroethene	liver	--	4.9E-002	--	4.9E-002
			Thallium	--	--	--	--	Thallium	--	--	--	--	--
			Toluene	--	--	--	--	Toluene	CNS	--	2.0E-001	--	2.0E-001
			Trichloroethene	--	4.9E-006	--	4.9E-006	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	--	--	--	--	--
			Vinyl Chloride	--	2.0E-008	--	2.0E-008	Vinyl Chloride	CNS	--	--	--	--

Table 6-2-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: Area2RME wk4\TT\_sum\_RWw2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--	4.6E-004	--	4.6E-004	Zinc			1.7E+001	--	1.7E+001
			(total)					(total)					
Total Risk Across Subsurface Soil							1.6E-001	Total Hazard Index Across Subsurface Soil					2.8E+003
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	2.4E+002
Total Skin HI:	2.3E+003
Total Thyroid HI:	5.3E+000
Total Liver HI:	1.8E+002
Total Circulatory System HI:	4.9E+000
Total CNS HI:	2.3E+000
Total Fetotoxic HI:	1.5E+000
Total GI Tract HI:	1.5E+000
Total Respiratory HI:	4.9E+000
Total Eyes HI:	1.4E+002
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.2E+001
Total Adrenal HI:	0.0E+000
Total Heart HI:	3.2E+002
Total Skeletal System HI:	2.8E+002
Total Thyroid HI:	5.3E+000
Total Blood Disorders HI:	2.6E+000

Table 6-2-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area2CT wk41 IT sum fLMW2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	5.7E-005	--	1.1E-003	1.2E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	1.4E-003	--	2.8E-002	2.9E-002
			1,1,2,2-Tetrachloroethane	2.3E-010	--	6.3E-009	6.5E-009	1,1,2,2-Tetrachloroethane	liver	2.6E-007	--	7.3E-006	7.6E-006
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	1.0E-003	--	2.0E-002	2.1E-002
			1,2-Dichloroethane	5.1E-008	--	1.0E-006	1.1E-006	1,2-Dichloroethane	fetotoxic	2.6E-004	--	5.1E-003	5.4E-003
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	kidney	1.7E-003	--	3.2E-002	3.4E-002
			1,2-Dichloropropane	5.7E-009	--	1.1E-007	1.2E-007	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	4.4E-004	--	8.6E-003	9.0E-003
			1,4-Dichlorobenzene	6.8E-010	--	1.3E-008	1.4E-008	1,4-Dichlorobenzene	GI tract	1.3E-005	--	2.6E-004	2.7E-004
			2-Butanone	--	--	--	--	2-Butanone	liver	3.3E-003	--	6.8E-002	7.1E-002
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.0E-003	--	2.0E-002	2.0E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.1E-002	--	2.2E-001	2.3E-001
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	1.1E-003	--	2.1E-002	2.2E-002
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	1.9E-003	--	3.8E-002	4.0E-002
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	2.0E-003	--	3.9E-002	4.1E-002
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	1.6E-002	--	4.7E-001	4.9E-001
			4,4'-DDD	2.5E-008	--	4.8E-007	5.1E-007	4,4'-DDD	liver	--	--	--	--
			4,4'-DDE	9.4E-009	--	1.8E-007	1.9E-007	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	1.8E-008	--	3.5E-007	3.7E-007	4,4'-DDT	fetotoxic	1.5E-003	--	2.9E-002	3.1E-002
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	1.1E-004	--	2.1E-003	2.3E-003
			Acetone	--	--	--	--	Acetone	fetotoxic	5.3E-003	--	1.3E-001	1.4E-001
			Aldrin	4.1E-006	--	8.0E-005	8.4E-005	Aldrin	liver	1.1E-001	--	2.2E+000	2.3E+000
			alpha-BHC	6.5E-008	--	1.3E-006	1.3E-006	alpha-BHC	liver	--	--	--	--
			Aluminum	--	--	--	--	Aluminum	circulatory	3.6E-003	--	7.1E-002	7.4E-002
			Anthracene	--	--	--	--	Anthracene	GI tract	1.9E-006	--	3.7E-005	3.9E-005
			Antimony	--	--	--	--	Antimony	skin	1.8E-001	--	3.5E+002	3.5E+002
			Aroclor-1248	--	--	--	--	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	2.3E-006	--	5.0E-005	5.2E-005	Aroclor-1254	liver	7.9E-001	--	1.7E+001	1.8E+001
			Aroclor-1260	2.1E-004	--	4.2E-003	4.4E-003	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	3.7E-007	--	7.5E-006	7.9E-006	Arsenic	circulatory	1.1E-002	--	2.3E-001	2.5E-001
			Barium	--	--	--	--	Barium	--	1.7E-002	--	3.3E-001	3.5E-001
			Benzene	8.7E-008	--	1.9E-006	2.0E-006	Benzene	blood disorders	1.4E-002	--	3.0E-001	3.2E-001
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	2.6E-005	--	5.1E-004	5.4E-004
			Benzo(a)anthracene	6.2E-008	--	1.2E-006	1.3E-006	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	3.4E-007	--	7.9E-006	8.2E-006	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	1.2E-007	--	2.4E-006	2.5E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	1.2E-008	--	2.4E-007	2.5E-007	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	CNS	5.0E-005	--	9.7E-004	1.0E-003
			Beryllium	--	--	--	--	Beryllium	kidney	7.5E-005	--	1.5E-001	1.5E-001
			beta-BHC	4.5E-008	--	8.8E-007	9.3E-007	beta-BHC	liver	--	--	--	--
			bis(2-Chloroethyl) ether	3.8E-006	--	7.4E-005	7.8E-005	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	1.0E-006	--	2.0E-005	2.1E-005	bis(2-Ethylhexyl)phthalate	liver	5.0E-002	--	9.9E-001	1.0E+000
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	9.2E-004	--	1.8E-002	1.9E-002
			Cadmium	--	--	--	--	Cadmium	kidney	4.6E-002	--	3.6E+001	3.6E+001
			Chloroform	2.7E-008	--	5.5E-007	5.7E-007	Chloroform	circulatory	6.1E-003	--	1.3E-001	1.3E-001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	4.3E-004	--	2.1E+000	2.1E+000
			Chrysene	8.7E-010	--	4.1E-008	4.2E-008	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	1.0E-005	--	2.0E-004	2.1E-004
			Cobalt	--	--	--	--	Cobalt	heart	2.4E-004	--	4.7E-003	4.9E-003
			Copper	--	--	--	--	Copper	liver	1.4E-002	--	4.7E-001	4.9E-001
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	2.7E-004	--	5.4E-003	5.6E-003
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	3.5E-005	--	6.9E-004	7.2E-004
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	1.1E-005	--	2.2E-004	2.3E-004
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	1.7E-003	--	3.4E-002	3.6E-002
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	2.8E-004	--	5.6E-003	5.9E-003

Table 6-2-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: Area2CT.wk4\1 IT sum RUMw2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	3.0E-003	--	6.3E-002	6.6E-002
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	4.5E-005	--	8.8E-004	9.2E-004
			Fluorene	--	--	--	--	Fluorene	skeletal	2.0E-004	--	3.9E-003	4.1E-003
			Hexachlorobutadiene	2.3E-009	--	4.4E-008	4.7E-008	Hexachlorobutadiene	low body wt	2.0E-003	--	4.0E-002	4.2E-002
			Indeno(1,2,3-cd)pyrene	3.2E-008	--	6.3E-007	6.6E-007	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Iron	--	--	--	--	Iron	--	2.8E-002	--	5.5E-001	5.8E-001
			Isophorone	5.4E-008	--	1.0E-006	1.1E-006	Isophorone	kidney	3.9E-003	--	7.7E-002	8.1E-002
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	8.8E-003	--	1.7E-001	1.8E-001
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methylene Chloride	1.6E-008	--	5.7E-007	5.8E-007	Methylene Chloride	liver	5.0E-004	--	1.8E-002	1.8E-002
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	1.1E-006	--	2.3E-005	2.4E-005
			Naphthalene	--	--	--	--	Naphthalene	circulatory	1.1E-002	--	2.1E-001	2.2E-001
			Nickel	--	--	--	--	Nickel	low body wt	1.2E-003	--	4.7E-001	4.7E-001
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	5.5E-007	--	1.2E-005	1.2E-005
			Pentachlorophenol	2.4E-007	--	4.6E-006	4.9E-006	Pentachlorophenol	liver	9.2E-004	--	1.8E-002	1.9E-002
			Phenol	--	--	--	--	Phenol	liver	1.2E-004	--	2.4E-003	2.6E-003
			Pyrene	--	--	--	--	Pyrene	liver	1.2E-004	--	2.3E-003	2.4E-003
			Selenium	--	--	--	--	Selenium	liver	7.3E-004	--	1.4E-002	1.5E-002
			Silver	--	--	--	--	Silver	skin	3.1E-003	--	2.8E-001	2.9E-001
			Styrene	--	--	--	--	Styrene	liver	1.1E-004	--	2.2E-003	2.3E-003
			Tetrachloroethene	1.4E-006	--	2.8E-005	2.9E-005	Tetrachloroethene	liver	3.9E-002	--	7.5E-001	7.9E-001
			Thallium	--	--	--	--	Thallium	--	9.0E-003	--	1.8E-001	1.9E-001
			Toluene	--	--	--	--	Toluene	liver	2.8E-003	--	5.6E-002	5.9E-002
			Trichloroethene	1.2E-007	--	2.4E-006	2.5E-006	Trichloroethene	liver	2.6E-002	--	5.1E-001	5.4E-001
			Vanadium	--	--	--	--	Vanadium	circulatory	7.6E-004	--	1.5E-002	1.6E-002
			Vinyl Chloride	6.5E-009	--	1.3E-007	1.3E-007	Vinyl Chloride	liver	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	7.9E-004	--	1.7E-002	1.8E-002
			Zinc	--	--	--	--	Zinc	thyroid	1.2E-002	--	7.9E-001	8.0E-001
			(total)	2.5E-004	--	4.9E-003	5.1E-003	(total)	--	1.5E+000	--	4.2E+002	4.2E+002
	AIR	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	4.5E-003	--	4.5E-003
			1,1-Dichloroethene	--	--	--	--	1,1-Dichloroethene	--	--	--	--	--
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	2.6E-003	--	2.6E-003
			1,1,2-Trichloroethane	--	1.2E-008	--	1.2E-008	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	4.3E-009	--	4.3E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	4.8E-002	--	4.8E-002
			1,2-Dichloroethane	--	1.4E-006	--	1.4E-006	1,2-Dichloroethane	circulatory	--	1.5E-001	--	1.5E-001
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	8.0E-002	--	8.0E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	4.3E-004	--	4.3E-004
			1,4-Dichlorobenzene	--	1.3E-008	--	1.3E-008	1,4-Dichlorobenzene	liver	--	3.5E-005	--	3.5E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	7.4E-004	--	7.4E-004
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.4E+000	--	1.4E+000
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	2.8E-002	--	2.8E-002
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE	--	--	--	--	--
			4,4'-DDT	--	2.2E-009	--	2.2E-009	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Aldrin	--	5.1E-007	--	5.1E-007	Aldrin	--	--	--	--	--
			alpha-BHC	--	8.5E-009	--	8.5E-009	alpha-BHC	--	--	--	--	--

Table 6-2-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area2C1.wk4\1.TT\_sum\_RUWa2C1

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	5.7E-008	--	5.7E-008	Aroclor-1242		--		--	
			Aroclor-1248	--	2.2E-006	--	2.2E-006	Aroclor-1248		--		--	
			Aroclor-1254	--	2.9E-007	--	2.9E-007	Aroclor-1254		--		--	
			Aroclor-1260	--	2.3E-005	--	2.3E-005	Aroclor-1260		--		--	
			Arsenic	--	4.4E-007	--	4.4E-007	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--	9.6E-001	--	9.6E-001
			Benzene	--	1.4E-006	--	1.4E-006	Benzene	blood disorders	--	4.0E-001	--	4.0E-001
			Benzoic Acid	--		--		Benzoic Acid		--		--	
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	1.9E-008	--	1.9E-008	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	1.1E-008	--	1.1E-008	Beryllium	respiratory	--	3.4E-003	--	3.4E-003
			beta-BHC	--	5.6E-009	--	5.6E-009	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	6.5E-006	--	6.5E-006	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	1.1E-007	--	1.1E-007	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	2.7E-006	--	2.7E-006	Cadmium		--		--	
			Chlorobenzene	--		--		Chlorobenzene	liver	--	2.3E-004	--	2.3E-004
			Chloroform	--	5.1E-006	--	5.1E-006	Chloroform	liver	--	1.0E+001	--	1.0E+001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	3.5E-005	--	3.5E-005	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	1.1E-002	--	1.1E-002
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Hexachlorobenzene	--	4.9E-009	--	4.9E-009	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.6E-008	--	1.6E-008	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	1.5E+000	--	1.5E+000
			Mercury	--		--		Mercury	CNS	--	5.2E-003	--	5.2E-003
			Methylene Chloride	--	9.4E-008	--	9.4E-008	Methylene Chloride	respiratory	--	9.3E-004	--	9.3E-004
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	2.5E-001	--	2.5E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	



Table 6-2-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: Area2CT\_wkd1.TT\_sum\_RJWa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	3.0E-004	--	3.0E-004
			Tetrachloroethene	--	8.7E-007	--	8.7E-007	Tetrachloroethene	liver	--	4.3E-002	--	4.3E-002
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	1.7E-001	--	1.7E-001
			Trichloroethene	--	8.6E-007	--	8.6E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	3.4E-007	--	3.4E-007	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		8.1E-005		8.1E-005	(total)			1.5E+001		1.5E+001
Total Risk Across Subsurface Soil							5.2E-003	Subsurface Soil					4.3E+002
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	3.7E+001
Total Skin HI:	3.5E+002
Total Thyroid HI:	8.0E-001
Total Liver HI:	3.6E+001
Total Circulatory System HI:	1.1E+000
Total CNS HI:	1.7E+000
Total Fetotoxic HI:	1.1E+000
Total GI Tract HI:	2.4E-001
Total Respiratory HI:	2.0E+000
Total Eyes HI:	2.3E-003
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.9E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	4.9E-003
Total Skeletal System HI:	4.1E-003
Total Thyroid HI:	8.0E-001
Total Blood Disorders HI:	7.2E-001

Table 6-2-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: UTI2RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Sediment Area 2	2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	3.4E-005		1.7E-004	2.1E-004
			2-Methylnaphthalene					2-Methylnaphthalene	GI Tract	9.0E-006		4.5E-005	5.4E-005
			Aluminum					Aluminum	circulatory system	5.5E-003		2.8E-003	8.2E-003
			Anthracene					Anthracene	GI Tract	3.1E-007		1.6E-006	1.9E-006
			Arsenic	6.1E-006		9.7E-006	1.6E-005	Arsenic	circulatory system	3.8E-002		5.9E-002	9.7E-002
			Barium					Barium	NA	1.5E-003		7.4E-004	2.2E-003
			Benzene	1.6E-007		9.1E-007	1.1E-006	Benzene	blood disorders	5.3E-003		2.9E-002	3.5E-002
			Benzo(a)anthracene	2.1E-007		1.1E-006	1.3E-006	Benzo(a)anthracene	NA				
			Benzo(a)pyrene	2.0E-006		1.6E-005	1.8E-005	Benzo(a)pyrene	NA				
			Benzo(b)fluoranthene	1.8E-007		8.9E-007	1.1E-006	Benzo(b)fluoranthene	NA				
			Benzo(k)fluoranthene	2.0E-008		1.0E-007	1.2E-007	Benzo(k)fluoranthene	NA				
			Beryllium					Beryllium	kidney	2.6E-004		1.3E-002	1.4E-002
			bis(2-Chloroethyl) ether	2.5E-007		1.2E-006	1.5E-006	bis(2-Chloroethyl) ether	reproductive system				
			bis(2-Ethylhexyl)phthalate	2.5E-008		1.2E-007	1.5E-007	bis(2-Ethylhexyl)phthalate	liver	2.5E-004		1.2E-003	1.5E-003
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	9.6E-007		4.8E-006	5.8E-006
			Cadmium					Cadmium	kidney	5.2E-003		5.2E-001	5.3E-001
			Chloroform	7.4E-012		3.9E-009	3.9E-009	Chloroform	circulatory system	3.4E-007		1.8E-006	2.1E-006
			Chromium (total)					Chromium (total)		1.1E-002		5.4E-002	6.5E-002
			Chrysene	2.0E-009		2.5E-008	2.7E-008	Chrysene	liver				
			Copper					Copper	liver	1.1E-003		8.8E-004	1.9E-003
			Dibenzo(a,h)anthracene	4.7E-007		2.6E-006	3.1E-006	Dibenzo(a,h)anthracene					
			Ethyl Benzene					Ethyl Benzene	liver	1.5E-006		8.0E-006	9.5E-006
			Fluoranthene					Fluoranthene	kidney	2.8E-005		1.4E-004	1.7E-004
			Indeno(1,2,3-cd)pyrene	1.1E-007		5.6E-007	6.7E-007	Indeno(1,2,3-cd)pyrene	NA				
			Iron					Iron		5.2E-002		2.6E-002	7.9E-002
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	2.1E-002		1.0E-002	3.1E-002
			Mercury					Mercury	low body weight				
			Naphthalene					Naphthalene	circulatory system	6.2E-006		3.1E-005	3.7E-005
			Nickel					Nickel	low body weight	8.1E-004		8.2E-003	9.0E-003
			Pyrene					Pyrene	liver	4.1E-005		2.1E-004	2.5E-004
			Toluene					Toluene	liver	3.2E-007		1.6E-006	1.9E-006
			Vanadium					Vanadium	circulatory system	2.3E-003		1.2E-003	3.5E-003
			Xylenes (total)					Xylenes (total)	fetotoxic	1.1E-007		6.3E-007	7.4E-007
			Zinc					Zinc	thyroid	4.4E-004		7.3E-004	1.2E-003
(Total)				9.6E-006		3.3E-005	4.2E-005	(Total)		1.4E-001		7.3E-001	8.8E-001
				Total Risk Across Sediments								Total Hazard Index Across All Exposure Routes	
												8.8E-001	

Total Circulatory System HI =	1.1E-001
Total Low Body Weight HI =	9.0E-003
Total Mammary HI =	5.8E-006
Total Fetotoxic HI =	7.4E-007
Total GI Tract HI =	5.6E-005
Total Thyroid HI =	1.2E-003
Total Kidney HI =	5.7E-001
Total Liver HI =	3.7E-003
Total Blood Disorders HI =	3.5E-002

Table 6-2-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: UTI2CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
Sediment	Sediment	Ditch Area 2	2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	6.0E-007		6.0E-007	1.2E-006	
			2-Methylnaphthalene					2-Methylnaphthalene	GI Tract	1.6E-007		1.6E-007	3.1E-007	
			Aluminum					Aluminum	circulatory system	9.5E-005		9.5E-006	1.0E-004	
			Anthracene					Anthracene	GI Tract	5.4E-009		5.4E-009	1.1E-008	
			Arsenic	2.1E-008		6.7E-009	2.8E-008	Arsenic	circulatory system	6.6E-004		2.0E-004	8.6E-004	
			Barium					Barium	NA	2.5E-005		2.5E-006	2.8E-005	
			Benzene	5.7E-010		6.3E-010	1.2E-009	Benzene	blood disorders	9.1E-005		1.0E-004	1.9E-004	
			Benzo(a)anthracene	7.2E-010		7.2E-010	1.4E-009	Benzo(a)anthracene	NA					
			Benzo(a)pyrene	7.0E-009		1.1E-008	1.8E-008	Benzo(a)pyrene	NA					
			Benzo(b)fluoranthene	6.1E-010		6.1E-010	1.2E-009	Benzo(b)fluoranthene	NA					
			Benzo(k)fluoranthene	7.0E-011		7.0E-011	1.4E-010	Benzo(k)fluoranthene	NA					
			Beryllium					Beryllium	kidney	4.6E-006		4.6E-005	5.1E-005	
			bis(2-Chloroethyl) ether	8.6E-010		8.6E-010	1.7E-009	bis(2-Chloroethyl) ether	reproductive system					
			bis(2-Ethylhexyl)phthalate	8.6E-011		8.6E-011	1.7E-010	bis(2-Ethylhexyl)phthalate	liver	4.3E-006		4.3E-006	8.6E-006	
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	1.7E-008		1.7E-008	3.3E-008	
			Cadmium					Cadmium	kidney	9.0E-005		1.8E-003	1.9E-003	
			Chloroform	2.6E-014		2.7E-012	2.7E-012	Chloroform	circulatory system	5.9E-009		6.1E-009	1.2E-008	
			Chromium (total)					Chromium (total)		1.9E-004		1.9E-004	3.7E-004	
			Chrysene	7.0E-012		1.7E-011	2.4E-011	Chrysene	liver					
			Copper					Copper	liver	1.8E-005		3.0E-006	2.1E-005	
			Dibenzo(a,h)anthracene	1.6E-009		1.8E-009	3.4E-009	Dibenzo(a,h)anthracene						
			Ethyl Benzene					Ethyl Benzene	liver	2.5E-008		2.8E-008	5.3E-008	
			Fluoranthene					Fluoranthene	kidney	4.9E-007		4.9E-007	9.8E-007	
			Indeno(1,2,3-cd)pyrene	3.9E-010		3.9E-010	7.8E-010	Indeno(1,2,3-cd)pyrene	NA					
			Iron					Iron		9.1E-004		9.1E-005	1.0E-003	
			Lead					Lead	CNS					
			Manganese					Manganese	kidney	3.6E-004		3.6E-005	3.9E-004	
			Mercury					Mercury	low body weight					
			Naphthalene					Naphthalene	circulatory system	1.1E-007		1.1E-007	2.2E-007	
			Nickel					Nickel	low body weight	1.4E-005		2.8E-005	4.2E-005	
			Pyrene					Pyrene	liver	7.2E-007		7.2E-007	1.4E-006	
			Toluene					Toluene	liver	5.5E-009		5.5E-009	1.1E-008	
			Vanadium					Vanadium	circulatory system	4.0E-005		4.0E-006	4.4E-005	
			Xylenes (total)					Xylenes (total)	fetotoxic	2.0E-009		2.2E-009	4.1E-009	
			Zinc					Zinc	thyroid	7.6E-006		2.5E-006	1.0E-005	
(Total)				3.3E-008		2.3E-008	5.6E-008	(Total)		2.5E-003		5.0E-003		
				Total Risk Across Sediments				5.6E-008					Total Hazard Index Across All Exposure Routes	5.0E-003

Total Circulatory System HI =	1.0E-003
Total Low Body Weight HI =	4.2E-005
Total Mammary HI =	3.3E-008
Total Fetotoxic HI =	4.1E-009
Total GI Tract HI =	3.2E-007
Total Thyroid HI =	1.0E-005
Total Kidney HI =	2.3E-003
Total Liver HI =	3.1E-005
Total Blood Disorders HI =	1.9E-004

Table 6-2-5  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: Area2RME.wd\1.TT\_sum\_IRWa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	1.1E-004	--	7.4E-003	7.5E-003
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	2.8E-003	--	1.8E-001	1.9E-001
			1,1,2,2-Tetrachloroethane	2.2E-009	--	2.1E-007	2.1E-007	1,1,2,2-Tetrachloroethane	liver	5.1E-007	--	4.9E-005	4.9E-005
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	2.0E-003	--	1.3E-001	1.3E-001
			1,2-Dichloroethane	5.0E-007	--	3.3E-005	3.4E-005	1,2-Dichloroethane	fetotoxic	5.1E-004	--	3.4E-002	3.5E-002
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	3.2E-003	--	2.1E-001	2.2E-001
			1,2-Dichloropropane	5.6E-008	--	3.7E-006	3.8E-006	1,2-Dichloropropane	GI tract		--		
			1,2,4-Trichlorobenzene		--			1,2,4-Trichlorobenzene	low body wt	8.6E-004	--	5.7E-002	5.8E-002
			1,4-Dichlorobenzene	6.7E-009	--	4.4E-007	4.5E-007	1,4-Dichlorobenzene	GI tract	2.6E-005	--	1.7E-003	1.7E-003
			2-Butanone		--			2-Butanone	liver	6.4E-003	--	4.5E-001	4.5E-001
			2-Hexanone		--			2-Hexanone	CNS	1.8E-003	--	1.3E-001	1.3E-001
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	2.2E-002	--	1.5E+000	1.5E+000
			2-Methylphenol		--			2-Methylphenol	liver	2.1E-003	--	1.4E-001	1.4E-001
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	3.8E-003	--	2.5E-001	2.5E-001
			2,6-Dinitrotoluene		--			2,6-Dinitrotoluene			--		
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	3.9E-003	--	2.6E-001	2.6E-001
			4-Methylphenol		--			4-Methylphenol	respiratory	3.1E-002	--	3.1E+000	3.2E+000
			4,4'-DDD	2.4E-007	--	1.6E-005	1.6E-005	4,4'-DDD	liver		--		
			4,4'-DDE	9.1E-008	--	6.1E-006	6.2E-006	4,4'-DDE	liver		--		
			4,4'-DDT	1.8E-007	--	1.2E-005	1.2E-005	4,4'-DDT	fetotoxic	2.9E-003	--	1.9E-001	2.0E-001
			Acenaphthene		--			Acenaphthene	eyes	2.1E-004	--	1.4E-002	1.4E-002
			Acetone		--			Acetone	fetotoxic	1.0E-002	--	8.7E-001	8.8E-001
			Aldrin	4.0E-005	--	2.7E-003	2.7E-003	Aldrin	liver	2.2E-001	--	1.5E+001	1.5E+001
			alpha-BHC	6.4E-007	--	4.2E-005	4.3E-005	alpha-BHC	liver		--		
			Aluminum		--			Aluminum	circulatory	7.0E-003	--	4.7E-001	4.7E-001
			Anthracene		--			Anthracene	GI tract	3.7E-006	--	2.5E-004	2.5E-004
			Antimony		--			Antimony	skin	3.5E-001	--	2.3E+003	2.3E+003
			Aroclor-1248		--			Aroclor-1248	liver		--		
			Aroclor-1254	2.2E-005	--	1.8E-003	1.7E-003	Aroclor-1254	liver	1.5E+000	--	1.1E+002	1.2E+002
			Aroclor-1260	2.1E-003	--	1.4E-001	1.4E-001	Aroclor-1260	circulatory		--		
			Arsenic	3.6E-006	--	2.5E-004	2.5E-004	Arsenic	circulatory	2.2E-002	--	1.5E+000	1.6E+000
			Barium		--			Barium		3.3E-002	--	2.2E+000	2.2E+000
			Benzene	8.5E-007	--	6.3E-005	6.4E-005	Benzene	blood disorders	2.7E-002	--	2.0E+000	2.0E+000
			Benzoic Acid		--			Benzoic Acid	GI tract	5.1E-005	--	3.4E-003	3.5E-003
			Benzo(a)anthracene	6.0E-007	--	4.0E-005	4.1E-005	Benzo(a)anthracene			--		
			Benzo(a)pyrene	3.3E-006	--	2.8E-004	2.8E-004	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.2E-006	--	7.8E-005	8.0E-005	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.2E-007	--	7.8E-006	8.0E-006	Benzo(k)fluoranthene			--		
			Benzyl Alcohol		--			Benzyl Alcohol	CNS	9.7E-005	--	6.4E-003	6.5E-003
			Beryllium		--			Beryllium	kidney	1.5E-004	--	9.6E-001	9.6E-001
			beta-BHC	4.4E-007	--	2.9E-005	3.0E-005	beta-BHC	liver		--		
			bis(2-Chloroethyl) ether	3.7E-005	--	2.5E-003	2.5E-003	bis(2-Chloroethyl) ether	reproductive		--		
			bis(2-Ethylhexyl)phthalate	9.8E-006	--	6.5E-004	6.6E-004	bis(2-Ethylhexyl)phthalate	liver	9.8E-002	--	6.5E+000	6.6E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	1.8E-003	--	1.2E-001	1.2E-001
			Cadmium		--			Cadmium	kidney	9.1E-002	--	2.4E+002	2.4E+002
			Chloroform	2.6E-007	--	1.8E-005	1.8E-005	Chloroform	circulatory	1.2E-002	--	8.3E-001	8.4E-001
			Chromium 3+		--			Chromium 3+	liver	8.4E-004	--	1.4E+001	1.4E+001
			Chrysene	8.5E-009	--	1.4E-006	1.4E-006	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	2.0E-005	--	1.3E-003	1.3E-003
			Cobalt		--			Cobalt	heart	4.7E-004	--	3.1E-002	3.2E-002
			Copper		--			Copper	liver	2.8E-002	--	3.1E+000	3.1E+000
			Dibenzofuran		--			Dibenzofuran	dec growth rate	5.4E-004	--	3.5E-002	3.6E-002
			Diethylphthalate		--			Diethylphthalate	low body wt	8.8E-005	--	4.5E-003	4.6E-003
			Dimethylphthalate		--			Dimethylphthalate	GI tract	2.2E-005	--	1.5E-003	1.5E-003
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	3.3E-003	--	2.3E-001	2.3E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		5.6E-004	--	3.7E-002	3.7E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	5.8E-003	--	4.2E-001	4.3E-001
			Fluoranthene		--			Fluoranthene	kidney	8.8E-005	--	5.8E-003	5.9E-003
			Fluorene		--			Fluorene	skeletal	3.9E-004	--	2.8E-002	2.8E-002
			Hexachlorobutadiene	2.2E-008	--	1.5E-006	1.5E-006	Hexachlorobutadiene	low body wt	4.0E-003	--	2.6E-001	2.7E-001
			Indeno(1,2,3-cd)pyrene	3.1E-007	--	2.1E-005	2.1E-005	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		5.5E-002	--	3.6E+000	3.7E+000

Table 6-2-5  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario	Trifluoromethane	Future
Receptor	Population	Routine Worker
Receptor	Age	Adult

File: Area2RME wk41 TT sum RWs2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Isophorone	5.2E-007	--	3.5E-005	3.5E-005	Isophorone	kidney	7.7E-003	--	5.1E-001	5.2E-001
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	1.7E-002	--	1.1E+000	1.2E+000
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methylene Chloride	1.6E-007	--	1.9E-005	1.9E-005	Methylene Chloride	liver	9.7E-004	--	1.2E-001	1.2E-001
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	2.1E-006	--	1.5E-004	1.6E-004
			Naphthalene	--	--	--	--	Naphthalene	circulatory	2.1E-002	--	1.4E+000	1.4E+000
			Nickel	--	--	--	--	Nickel	low body wt	2.4E-003	--	3.1E+000	3.1E+000
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	1.1E-006	--	7.9E-005	8.0E-005
			Pentachlorophenol	2.3E-006	--	1.5E-004	1.8E-004	Pentachlorophenol	liver	1.8E-003	--	1.2E-001	1.2E-001
			Phenol	--	--	--	--	Phenol	liver	2.4E-004	--	1.6E-002	1.6E-002
			Pyrene	--	--	--	--	Pyrene	liver	2.3E-004	--	1.5E-002	1.5E-002
			Selenium	--	--	--	--	Selenium	liver	1.4E-003	--	9.4E-002	9.6E-002
			Silver	--	--	--	--	Silver	skin	6.0E-003	--	1.9E+000	1.9E+000
			Styrene	--	--	--	--	Styrene	liver	2.2E-004	--	1.5E-002	1.5E-002
			Tetrachloroethene	1.4E-005	--	9.3E-004	9.4E-004	Tetrachloroethene	liver	7.5E-002	--	5.0E+000	5.1E+000
			Thallium	--	--	--	--	Thallium	--	1.8E-002	--	1.2E+000	1.2E+000
			Toluene	--	--	--	--	Toluene	liver	5.6E-003	--	3.7E-001	3.7E-001
			Trichloroethene	1.2E-006	--	8.0E-005	8.1E-005	Trichloroethene	liver	5.0E-002	--	3.4E+000	3.4E+000
			Vanadium	--	--	--	--	Vanadium	circulatory	1.5E-003	--	9.9E-002	1.0E-001
			Vinyl Chloride	6.4E-008	--	4.2E-006	4.3E-006	Vinyl Chloride	liver	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	1.5E-003	--	1.1E-001	1.2E-001
			Zinc	--	--	--	--	Zinc	thyroid	2.4E-002	--	5.2E+000	5.3E+000
			(total)	2.4E-003	--	1.6E-001	1.6E-001	(total)	--	2.8E+000	--	2.8E+003	2.8E+003
	AIR	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	2.5E-003	--	2.5E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	5.6E-003	--	5.6E-003
			1,1,2-Trichloroethane	--	5.4E-008	--	5.4E-008	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.1E-007	--	1.1E-007	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	6.9E-002	--	6.9E-002
			1,2-Dichloroethane	--	4.7E-006	--	4.7E-006	1,2-Dichloroethane	circulatory	--	1.0E-001	--	1.0E-001
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	1.4E-001	--	1.4E-001
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	5.5E-004	--	5.5E-004
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	respiratory	--	3.0E-009	--	3.0E-009
			1,4-Dichlorobenzene	--	1.2E-007	--	1.2E-007	1,4-Dichlorobenzene	liver	--	6.7E-005	--	6.7E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	3.7E-007	--	3.7E-007
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	2.1E+000	--	2.1E+000
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	3.0E-002	--	3.0E-002
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4-Nitrophenol	--	--	--	--	4-Nitrophenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE	--	--	--	--	--
			4,4'-DDT	--	2.2E-011	--	2.2E-011	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Aldrin	--	4.5E-009	--	4.5E-009	Aldrin	--	--	--	--	--
			alpha-BHC	--	9.1E-011	--	9.1E-011	alpha-BHC	--	--	--	--	--
			Anthracene	--	--	--	--	Anthracene	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	--	--	--	--	--
			Aroclor-1242	--	2.5E-010	--	2.5E-010	Aroclor-1242	--	--	--	--	--
			Aroclor-1248	--	4.5E-009	--	4.5E-009	Aroclor-1248	--	--	--	--	--
			Aroclor-1254	--	3.4E-009	--	3.4E-009	Aroclor-1254	--	--	--	--	--
			Aroclor-1260	--	3.0E-008	--	3.0E-008	Aroclor-1260	--	--	--	--	--

Table 6-2-5  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: Arsg2RME\_v04\TT\_sum\_IRWv2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Arsenic	--	3.7E-009	--	3.7E-009	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	9.6E-004	--	9.6E-004
			Benzene	--	5.7E-006	--	5.7E-006	Benzene	blood disorders	--	3.2E-001	--	3.2E-001
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	2.1E-010	--	2.1E-010	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	--	--	--	--	--
			Beryllium	--	1.5E-010	--	1.5E-010	Beryllium	respiratory	--	8.5E-006	--	8.5E-006
			beta-BHC	--	5.0E-011	--	5.0E-011	beta-BHC	--	--	--	--	--
			bis(2-Chloroethyl) ether	--	4.5E-005	--	4.5E-005	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	2.6E-010	--	2.6E-010	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	3.4E-008	--	3.4E-008	Cadmium	--	--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	--	8.2E-010	--	--	8.2E-010
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	2.3E-002	--	2.3E-002
			Chloroform	--	1.6E-005	--	1.6E-005	Chloroform	liver	--	6.5E+000	--	6.5E+000
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	4.0E-007	--	4.0E-007	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Dibenzo(a,h)anthracene	--	--	--	--	Dibenzo(a,h)anthracene	--	--	--	--	--
			Dieldrin	--	9.2E-012	--	9.2E-012	Dieldrin	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Endosulfan I	--	--	--	--	Endosulfan I	--	--	--	--	--
			Endrin	--	--	--	--	Endrin	--	--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	7.9E-003	--	7.9E-003
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			gamma-Chlordane	--	1.0E-012	--	1.0E-012	gamma-Chlordane	--	4.0E-008	--	--	4.0E-008
			Heptachlor	--	1.6E-013	--	1.6E-013	Heptachlor	--	--	--	--	--
			Heptachlor epoxide	--	1.5E-013	--	1.5E-013	Heptachlor epoxide	--	--	--	--	--
			Hexachlorobenzene	--	2.8E-014	--	2.8E-014	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	4.8E-011	--	4.8E-011	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Isophorone	--	--	--	--	Isophorone	--	--	--	--	--
			Lead	--	--	--	--	Lead	--	--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	2.7E-003	--	2.7E-003
			Mercury	--	--	--	--	Mercury	CNS	--	1.2E-005	--	1.2E-005
			Methylene Chloride	--	1.5E-006	--	1.5E-006	Methylene Chloride	respiratory	--	2.9E-003	--	2.9E-003
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	3.6E-001	--	3.6E-001
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--

Table 6-2-5  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: Area2RME\_wk4.1.IT\_sum\_IRWa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	5.2E-004	--	5.2E-004
			Tetrachloroethene	--	3.5E-006	--	3.5E-006	Tetrachloroethene	liver	--	3.5E-002	--	3.5E-002
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	2.1E-001	--	2.1E-001
			Trichloroethene	--	6.0E-006	--	6.0E-006	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	1.9E-006	--	1.9E-006	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		8.5E-005		8.5E-005	(total)			9.8E+000		9.8E+000
Total Risk Across Subsurface Soil				1.6E-001				rd Index Across Subsurface Soil					2.8E+003
Total Risk Across All Media and All Exposure Routes				Reserved				s Subsurface Soil					

Total Kidney HI:	2.4E+002
Total Skin HI:	2.3E+003
Total Thyroid HI:	5.3E+000
Total Liver HI:	1.7E+002
Total Circulatory System HI:	4.9E+000
Total CNS HI:	2.7E+000
Total Fetotoxic HI:	1.2E+000
Total GI Tract HI:	1.5E+000
Total Respiratory HI:	3.2E+000
Total Eyes HI:	1.4E-002
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.2E-001
Total Adrenal HI:	0.0E+000
Total Heart HI:	3.2E-002
Total Skeletal System HI:	2.6E-002
Total Thyroid HI:	5.3E+000
Total Blood Disorders HI:	2.3E+000

Table 6-2-6  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age Adult

File: Area2CT.wk4\LT\_sum.fRWa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	4.9E-005	--	1.1E-003	1.2E-003
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	1.2E-003	--	2.8E-002	2.9E-002
			1,1,2,2-Tetrachloroethane	1.9E-010	--	6.3E-009	6.5E-009	1,1,2,2-Tetrachloroethane	liver	2.3E-007	--	7.3E-006	7.6E-006
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	8.8E-004	--	2.0E-002	2.1E-002
			1,2-Dichloroethane	4.4E-008	--	1.0E-006	1.0E-006	1,2-Dichloroethane	fetotoxic	2.3E-004	--	5.1E-003	5.4E-003
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	1.4E-003	--	3.2E-002	3.4E-002
			1,2-Dichloropropane	4.9E-009	--	1.1E-007	1.2E-007	1,2-Dichloropropane	GI tract		--		
			1,2,4-Trichlorobenzene		--			1,2,4-Trichlorobenzene	low body wt	3.8E-004	--	8.6E-003	8.9E-003
			1,4-Dichlorobenzene	5.9E-010	--	1.3E-008	1.4E-008	1,4-Dichlorobenzene	GI tract	1.1E-005	--	2.6E-004	2.7E-004
			2-Butanone		--			2-Butanone	liver	2.8E-003	--	6.8E-002	7.0E-002
			2-Hexanone		--			2-Hexanone	CNS	8.5E-004	--	2.0E-002	2.0E-002
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	9.8E-003	--	2.2E-001	2.3E-001
			2-Methylphenol		--			2-Methylphenol	liver	9.0E-004	--	2.1E-002	2.1E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.7E-003	--	3.8E-002	3.9E-002
			2,6-Dinitrotoluene		--			2,6-Dinitrotoluene			--		
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	1.7E-003	--	3.9E-002	4.0E-002
			4-Methylphenol		--			4-Methylphenol	respiratory	1.4E-002	--	4.7E-001	4.9E-001
			4,4'-DDD	2.1E-008	--	4.8E-007	5.1E-007	4,4'-DDD	liver		--		
			4,4'-DDE	8.0E-009	--	1.8E-007	1.9E-007	4,4'-DDE	liver		--		
			4,4'-DDT	1.5E-008	--	3.5E-007	3.7E-007	4,4'-DDT	fetotoxic	1.3E-003	--	2.9E-002	3.0E-002
			Acenaphthene		--			Acenaphthene	eyes	9.4E-005	--	2.1E-003	2.2E-003
			Acetone		--			Acetone	fetotoxic	4.5E-003	--	1.3E-001	1.4E-001
			Aldrin	3.5E-006	--	8.0E-005	8.4E-005	Aldrin	liver	9.6E-002	--	2.2E+000	2.3E+000
			alpha-BHC	5.6E-008	--	1.3E-006	1.3E-006	alpha-BHC	liver		--		
			Aluminum		--			Aluminum	circulatory	3.1E-003	--	7.1E-002	7.4E-002
			Anthracene		--			Anthracene	GI tract	1.6E-006	--	3.7E-005	3.9E-005
			Antimony		--			Antimony	skin	1.5E-001	--	3.5E+002	3.5E+002
			Aroclor-1248		--			Aroclor-1248	liver		--		
			Aroclor-1254	1.9E-006	--	5.0E-005	5.1E-005	Aroclor-1254	liver	6.8E-001	--	1.7E+001	1.8E+001
			Aroclor-1260	1.8E-004	--	4.2E-003	4.3E-003	Aroclor-1260	circulatory		--		
			Arsenic	3.1E-007	--	7.5E-006	7.8E-006	Arsenic	circulatory	9.7E-003	--	2.3E-001	2.4E-001
			Barium		--			Barium		1.4E-002	--	3.3E-001	3.4E-001
			Benzene	7.5E-008	--	1.9E-006	2.0E-006	Benzene	blood disorders	1.2E-002	--	3.0E-001	3.2E-001
			Benzoic Acid		--			Benzoic Acid	GI tract	2.3E-005	--	5.1E-004	5.4E-004
			Benzo(a)anthracene	5.3E-008	--	1.2E-006	1.3E-006	Benzo(a)anthracene			--		
			Benzo(a)pyrene	2.9E-007	--	7.9E-006	8.2E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.0E-007	--	2.4E-006	2.5E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.0E-008	--	2.4E-007	2.5E-007	Benzo(k)fluoranthene			--		
			Benzyl Alcohol		--			Benzyl Alcohol	CNS	4.3E-005	--	9.7E-004	1.0E-003
			Beryllium		--			Beryllium	kidney	6.4E-005	--	1.5E-001	1.5E-001
			beta-BHC	3.9E-008	--	8.8E-007	9.2E-007	beta-BHC	liver		--		
			bis(2-Chloroethyl) ether	3.2E-006	--	7.4E-005	7.7E-005	bis(2-Chloroethyl) ether	reproductive		--		
			bis(2-Ethylhexyl)phthalate	8.6E-007	--	2.0E-005	2.1E-005	bis(2-Ethylhexyl)phthalate	liver	4.3E-002	--	9.9E-001	1.0E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	7.9E-004	--	1.8E-002	1.9E-002
			Cadmium		--			Cadmium	kidney	4.0E-002	--	3.6E+001	3.6E+001
			Chloroform	2.3E-008	--	5.5E-007	5.7E-007	Chloroform	circulatory	5.3E-003	--	1.3E-001	1.3E-001
			Chromium 3+		--			Chromium 3+	liver	3.7E-004	--	2.1E+000	2.1E+000
			Chrysene	7.4E-010	--	4.1E-008	4.2E-008	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	8.6E-006	--	2.0E-004	2.1E-004
			Cobalt		--			Cobalt	heart	2.1E-004	--	4.7E-003	4.9E-003
			Copper		--			Copper	liver	1.2E-002	--	4.7E-001	4.8E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	2.3E-004	--	5.4E-003	5.6E-003
			Diethylphthalate		--			Diethylphthalate	low body wt	3.0E-005	--	6.9E-004	7.2E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	9.8E-006	--	2.2E-004	2.3E-004
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.5E-003	--	3.4E-002	3.6E-002
			Di-n-octylphthalate		--			Di-n-octylphthalate		2.4E-004	--	5.6E-003	5.8E-003
			Ethyl Benzene		--			Ethyl Benzene	liver	2.6E-003	--	6.3E-002	6.6E-002
			Fluoranthene		--			Fluoranthene	kidney	3.8E-005	--	8.8E-004	9.2E-004



Table 6-2-6  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age: Adult

File: Area2CT.wk4 \ TT\_sum\_IRWa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Fluorene		--			Fluorene	skeletal	1.7E-004	--	3.9E-003	4.0E-003
			Hexachlorobutadiene	1.9E-009	--	4.4E-008	4.6E-008	Hexachlorobutadiene	low body wt	1.7E-003	--	4.0E-002	4.2E-002
			Indeno(1,2,3-cd)pyrene	2.7E-008	--	6.3E-007	6.5E-007	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		2.4E-002	--	5.5E-001	5.7E-001
			Isophorone	4.6E-008	--	1.0E-006	1.1E-006	Isophorone	kidney	3.4E-003	--	7.7E-002	8.1E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	7.5E-003	--	1.7E-001	1.8E-001
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	1.4E-008	--	5.7E-007	5.8E-007	Methylene Chloride	liver	4.3E-004	--	1.8E-002	1.8E-002
			m,p-xylene		--			m,p-xylene	fetotoxic	9.2E-007	--	2.3E-005	2.4E-005
			Naphthalene		--			Naphthalene	circulatory	9.2E-003	--	2.1E-001	2.2E-001
			Nickel		--			Nickel	low body wt	1.0E-003	--	4.7E-001	4.7E-001
			ortho-xylene		--			ortho-xylene	fetotoxic	4.7E-007	--	1.2E-005	1.2E-005
			Pentachlorophenol	2.0E-007	--	4.6E-006	4.8E-006	Pentachlorophenol	liver	7.9E-004	--	1.8E-002	1.9E-002
			Phenol		--			Phenol	liver	1.1E-004	--	2.4E-003	2.5E-003
			Pyrene		--			Pyrene	liver	1.0E-004	--	2.3E-003	2.4E-003
			Selenium		--			Selenium	liver	6.2E-004	--	1.4E-002	1.5E-002
			Silver		--			Silver	skin	2.6E-003	--	2.8E-001	2.9E-001
			Styrene		--			Styrene	liver	9.8E-005	--	2.2E-003	2.3E-003
			Tetrachloroethene	1.2E-006	--	2.8E-005	2.9E-005	Tetrachloroethene	liver	3.3E-002	--	7.5E-001	7.9E-001
			Thallium		--			Thallium		7.7E-003	--	1.8E-001	1.8E-001
			Toluene		--			Toluene	liver	2.4E-003	--	5.6E-002	5.8E-002
			Trichloroethene	1.0E-007	--	2.4E-006	2.5E-006	Trichloroethene	liver	2.2E-002	--	5.1E-001	5.3E-001
			Vanadium		--			Vanadium	circulatory	6.5E-004	--	1.5E-002	1.6E-002
			Vinyl Chloride	5.6E-009	--	1.3E-007	1.3E-007	Vinyl Chloride	liver		--		
			Xylenes (total)		--			Xylenes (total)	fetotoxic	6.8E-004	--	1.7E-002	1.8E-002
			Zinc		--			Zinc	thyroid	1.0E-002	--	7.9E-001	8.0E-001
			(total)	2.1E-004		4.9E-003	5.1E-003	(total)		1.2E+000		4.2E+002	4.2E+002
	AIR	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	2.2E-003	--	2.2E-003
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	4.9E-003	--	4.9E-003
			1,1,2-Trichloroethane	--	9.4E-009	--	9.4E-009	1,1,2-Trichloroethane	liver	--	--	--	
			1,1,2,2-Tetrachloroethane	--	2.0E-008	--	2.0E-008	1,1,2,2-Tetrachloroethane	liver	--	--	--	
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	6.0E-002	--	6.0E-002
			1,2-Dichloroethane	--	8.3E-007	--	8.3E-007	1,2-Dichloroethane	circulatory	--	9.1E-002	--	9.1E-002
			1,2-Dichloroethane (total)	--	--	--		1,2-Dichloroethane (total)		--	--	--	
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	1.2E-001	--	1.2E-001
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	4.9E-004	--	4.9E-004
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	2.6E-009	--	2.6E-009
			1,4-Dichlorobenzene	--	2.1E-008	--	2.1E-008	1,4-Dichlorobenzene	liver	--	5.8E-005	--	5.8E-005
			2-Butanone	--	--	--		2-Butanone	CNS	--	3.2E-007	--	3.2E-007
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	1.8E+000	--	1.8E+000
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	2.6E-002	--	2.6E-002
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	
			4,4'-DDT	--	3.9E-012	--	3.9E-012	4,4'-DDT	liver	--	--	--	
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	
			Acenaphthylene	--	--	--		Acenaphthylene		--	--	--	
			Acetone	--	--	--		Acetone		--	--	--	

Table 6-2-6  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age: Adult

File: Area2CT wk41 TT sum RWs2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Aldrin	--	7.9E-010	--	7.9E-010	Aldrin		--		--	
			alpha-BHC	--	1.6E-011	--	1.6E-011	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	4.4E-011	--	4.4E-011	Aroclor-1242		--		--	
			Aroclor-1248	--	7.9E-010	--	7.9E-010	Aroclor-1248		--		--	
			Aroclor-1254	--	5.9E-010	--	5.9E-010	Aroclor-1254		--		--	
			Aroclor-1260	--	5.3E-009	--	5.3E-009	Aroclor-1260		--		--	
			Arsenic	--	6.4E-010	--	6.4E-010	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--		--	
			Benzene	--	1.0E-006	--	1.0E-006	Benzene	blood disorders	--	8.4E-004	--	8.4E-004
			Benzoic Acid	--		--		Benzoic Acid		--	2.8E-001	--	2.8E-001
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	3.7E-011	--	3.7E-011	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	2.5E-011	--	2.5E-011	Beryllium	respiratory	--	7.5E-006	--	7.5E-006
			beta-BHC	--	8.7E-012	--	8.7E-012	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	7.9E-006	--	7.9E-006	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	4.5E-011	--	4.5E-011	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	6.0E-009	--	6.0E-009	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	7.1E-010	--	7.1E-010
			Chlorobenzene	--		--		Chlorobenzene	liver	--	2.0E-002	--	2.0E-002
			Chloroform	--	2.8E-006	--	2.8E-006	Chloroform	liver	--	5.7E+000	--	5.7E+000
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	7.0E-008	--	7.0E-008	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Dieldrin	--	1.6E-012	--	1.6E-012	Dieldrin		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	7.0E-003	--	7.0E-003
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			gamma-Chlordane	--	1.8E-013	--	1.8E-013	gamma-Chlordane		--	3.5E-008	--	3.5E-008
			Heptachlor	--	2.8E-014	--	2.8E-014	Heptachlor		--		--	
			Heptachlor epoxide	--	2.7E-014	--	2.7E-014	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	4.9E-015	--	4.9E-015	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	8.4E-012	--	8.4E-012	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	2.3E-003	--	2.3E-003
			Mercury	--		--		Mercury	CNS	--	1.1E-005	--	1.1E-005

Table 6-2-6  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Routine Worker  
Receptor Age: Adult

File Area2CT.wk4\TT sum fRWa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Methylene Chloride	--	2.6E-007	--	2.6E-007	Methylene Chloride	respiratory	--	2.5E-003	--	2.5E-003
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	3.1E-001	--	3.1E-001
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--
			Silver	--	--	--	--	Silver	--	--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	4.6E-004	--	4.6E-004
			Tetrachloroethene	--	6.2E-007	--	6.2E-007	Tetrachloroethene	liver	--	3.1E-002	--	3.1E-002
			Thallium	--	--	--	--	Thallium	--	--	--	--	--
			Toluene	--	--	--	--	Toluene	CNS	--	1.8E-001	--	1.8E-001
			Trichloroethene	--	1.1E-006	--	1.1E-006	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	--	--	--	--	--
			Vinyl Chloride	--	3.4E-007	--	3.4E-007	Vinyl Chloride	CNS	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc	--	--	--	--	--
			(total)		1.5E-005		1.5E-005	(total)			8.6E+000		8.6E+000
Total Risk Across Subsurface Soil							5.1E-003	Index Across Subsurface Soil					4.3E+002
Total Risk Across All Media and All Exposure Routes							Reserved	Subsurface Soil					

Total Kidney HI:	3.7E+001
Total Skin HI:	3.5E+002
Total Thyroid HI:	8.0E-001
Total Liver HI:	3.1E+001
Total Circulatory System HI:	1.1E+000
Total CNS HI:	2.1E+000
Total Fetotoxic HI:	1.9E-001
Total GI Tract HI:	2.3E-001
Total Respiratory HI:	5.0E-001
Total Eyes HI:	2.2E-003
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.9E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	4.9E-003
Total Skeletal System HI:	4.0E-003
Total Thyroid HI:	8.0E-001
Total Blood Disorders HI:	5.0E-001

Table 6-2-7  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: IND2RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Sediment	Sediment	Ditch Area 2	2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	3.7E-006		1.7E-004	1.8E-004		
			2-Methylnaphthalene					2-Methylnaphthalene	GI Tract	9.8E-007		4.5E-005	4.6E-005		
			Aluminum					Aluminum	circulatory system	5.9E-004		2.8E-003	3.3E-003		
			Anthracene					Anthracene	GI Tract	3.4E-008		1.6E-006	1.6E-006		
			Arsenic	6.6E-007		9.7E-006	1.0E-005	Arsenic	circulatory system	4.1E-003		5.9E-002	6.3E-002		
			Barium					Barium	NA	1.6E-004		7.4E-004	9.0E-004		
			Benzene	1.8E-008		9.1E-007	9.3E-007	Benzene	blood disorders	5.7E-004		2.9E-002	3.0E-002		
			Benzo(a)anthracene	2.3E-008		1.1E-006	1.1E-006	Benzo(a)anthracene	NA						
			Benzo(a)pyrene	2.2E-007		1.6E-005	1.6E-005	Benzo(a)pyrene	NA						
			Benzo(b)fluoranthene	1.9E-008		8.9E-007	9.1E-007	Benzo(b)fluoranthene	NA						
			Benzo(k)fluoranthene	2.2E-009		1.0E-007	1.0E-007	Benzo(k)fluoranthene	NA						
			Beryllium					Beryllium	kidney	2.9E-005		1.3E-002	1.3E-002		
			bis(2-Chloroethyl) ether	2.7E-008		1.2E-006	1.3E-006	bis(2-Chloroethyl) ether	reproductive system						
			bis(2-Ethylhexyl)phthalate	2.7E-009		1.2E-007	1.3E-007	bis(2-Ethylhexyl)phthalate	liver	2.7E-005		1.2E-003	1.3E-003		
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	1.0E-007		4.8E-006	4.9E-006		
			Cadmium					Cadmium	kidney	5.6E-004		5.2E-001	5.2E-001		
			Chloroform	8.0E-013		3.9E-009	3.9E-009	Chloroform	circulatory system	3.7E-008		1.8E-006	1.8E-006		
			Chromium (total)					Chromium (total)		1.2E-003		5.4E-002	5.5E-002		
			Chrysene	2.2E-010		2.5E-008	2.5E-008	Chrysene	liver						
			Copper					Copper	liver	1.1E-004		8.8E-004	1.0E-003		
			Dibenzo(a,h)anthracene	5.1E-008		2.6E-006	2.7E-006	Dibenzo(a,h)anthracene							
			Ethyl Benzene					Ethyl Benzene	liver	1.6E-007		8.0E-006	8.2E-006		
			Fluoranthene					Fluoranthene	kidney	3.1E-006		1.4E-004	1.4E-004		
			Indeno(1,2,3-cd)pyrene	1.2E-008		5.6E-007	5.7E-007	Indeno(1,2,3-cd)pyrene	NA						
			Iron					Iron		5.7E-003		2.6E-002	3.2E-002		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	2.2E-003		1.0E-002	1.3E-002		
			Mercury					Mercury	low body weight						
			Naphthalene					Naphthalene	circulatory system	6.7E-007		3.1E-005	3.2E-005		
			Nickel					Nickel	low body weight	8.8E-005		8.2E-003	8.3E-003		
			Pyrene					Pyrene	liver	4.5E-006		2.1E-004	2.1E-004		
			Toluene					Toluene	liver	3.4E-008		1.6E-006	1.6E-006		
			Vanadium					Vanadium	circulatory system	2.5E-004		1.2E-003	1.4E-003		
			Xylenes (total)					Xylenes (total)	fetotoxic	1.2E-008		6.3E-007	6.4E-007		
			Zinc					Zinc	thyroid	4.7E-005		7.3E-004	7.8E-004		
(Total)				1.0E-006		3.3E-005	3.4E-005	(Total)		1.6E-002		7.3E-001	7.5E-001		
				Total Risk Across Sediments				3.4E-005					Total Hazard Index Across All Exposure Routes		7.5E-001

Total Circulatory System HI =	6.8E-002
Total Low Body Weight HI =	8.3E-003
Total Mammary HI =	4.9E-006
Total Fetotoxic HI =	6.4E-007
Total GI Tract HI =	4.8E-005
Total Thyroid HI =	7.8E-004
Total Kidney HI =	5.5E-001
Total Liver HI =	2.5E-003
Total Blood Disorders HI =	3.0E-002

Table 6-2-8  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: IND2CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Ditch Area 2	2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	1.6E-006		2.6E-005	2.8E-005
			2-Methylnaphthalene					2-Methylnaphthalene	GI Tract	4.3E-007		6.9E-006	7.3E-006
			Aluminum					Aluminum	circulatory system	2.6E-004		4.2E-004	6.8E-004
			Anthracene					Anthracene	GI Tract	1.5E-008		2.4E-007	2.5E-007
			Arsenic	5.8E-008		2.9E-007	3.5E-007	Arsenic	circulatory system	1.8E-003		9.0E-003	1.1E-002
			Barium					Barium	NA	7.0E-005		1.1E-004	1.8E-004
			Benzene	1.6E-009		2.8E-008	2.9E-008	Benzene	blood disorders	2.5E-004		4.4E-003	4.7E-003
			Benzo(a)anthracene	2.0E-009		3.2E-008	3.4E-008	Benzo(a)anthracene	NA				
			Benzo(a)pyrene	1.9E-008		4.7E-007	4.9E-007	Benzo(a)pyrene	NA				
			Benzo(b)fluoranthene	1.7E-009		2.7E-008	2.8E-008	Benzo(b)fluoranthene	NA				
			Benzo(k)fluoranthene	1.9E-010		3.1E-009	3.3E-009	Benzo(k)fluoranthene	NA				
			Beryllium					Beryllium	kidney	1.3E-005		2.0E-003	2.0E-003
			bis(2-Chloroethyl) ether	2.4E-009		3.8E-008	4.0E-008	bis(2-Chloroethyl) ether	reproductive system				
			bis(2-Ethylhexyl)phthalate	2.4E-010		3.8E-009	4.0E-009	bis(2-Ethylhexyl)phthalate	liver	1.2E-005		1.9E-004	2.0E-004
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	4.6E-008		7.3E-007	7.7E-007
			Cadmium					Cadmium	kidney	2.5E-004		7.9E-002	7.9E-002
			Chloroform	7.0E-014		1.2E-010	1.2E-010	Chloroform	circulatory system	1.6E-008		2.7E-007	2.8E-007
			Chromium (total)					Chromium (total)		5.1E-004		8.1E-003	8.7E-003
			Chrysene	1.9E-011		7.5E-010	7.7E-010	Chrysene	liver				
			Copper					Copper	liver	5.0E-005		1.3E-004	1.8E-004
			Dibenzo(a,h)anthracene	4.5E-009		7.9E-008	8.4E-008	Dibenzo(a,h)anthracene					
			Ethyl Benzene					Ethyl Benzene	liver	7.0E-008		1.2E-006	1.3E-006
			Fluoranthene					Fluoranthene	kidney	1.3E-006		2.1E-005	2.3E-005
			Indeno(1,2,3-cd)pyrene	1.1E-009		1.7E-008	1.8E-008	Indeno(1,2,3-cd)pyrene	NA				
			Iron					Iron		2.5E-003		4.0E-003	6.5E-003
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	9.8E-004		1.6E-003	2.5E-003
			Mercury					Mercury	low body weight				
			Naphthalene					Naphthalene	circulatory system	2.9E-007		4.7E-006	5.0E-006
			Nickel					Nickel	low body weight	3.9E-005		1.2E-003	1.3E-003
			Pyrene					Pyrene	liver	2.0E-006		3.1E-005	3.3E-005
			Toluene					Toluene	liver	1.5E-008		2.4E-007	2.6E-007
			Vanadium					Vanadium	circulatory system	1.1E-004		1.8E-004	2.9E-004
			Xylenes (total)					Xylenes (total)	fetotoxic	5.4E-009		9.5E-008	1.0E-007
			Zinc					Zinc	thyroid	2.1E-005		1.1E-004	1.3E-004
(Total)				9.1E-008		9.9E-007	1.1E-006	(Total)		6.9E-003		1.1E-001	1.2E-001
Total Risk Across Sediments				1.1E-006				Total Hazard Index Across All Exposure Routes				1.2E-001	

Total Circulatory System HI =	1.2E-002
Total Low Body Weight HI =	1.3E-003
Total Mammary HI =	7.7E-007
Total Fetotoxic HI =	1.0E-007
Total GI Tract HI =	7.5E-006
Total Thyroid HI =	1.3E-004
Total Kidney HI =	8.4E-002
Total Liver HI =	4.2E-004
Total Blood Disorders HI =	4.7E-003

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

Table 6-2-9  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

File: FWORK2.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure			
Surface Water	Surface Water	Ditch Area 2	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	2.0E-005		3.4E-005	5.4E-005			
			1,2-Dichloroethene(total)					1,2-Dichloroethene(total)	kidney	6.5E-004		1.3E-003	1.9E-003			
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	1.2E-003		4.0E-003	5.1E-003			
			2-Butanone (MEK)					2-Butanone (MEK)	liver	4.6E-004		9.1E-005	5.5E-004			
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver	2.0E-004		4.1E-004	6.1E-004			
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	1.2E-003		9.6E-004	2.2E-003			
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory	3.5E-003		1.1E-002	1.5E-002			
			Acetone					Acetone	fetotoxic	7.4E-003		8.7E-004	8.3E-003			
			Aluminum					Aluminum	circulatory system	9.2E-004		1.1E-004	1.0E-003			
			Ammonia					Ammonia	kidney							
			Arsenic	1.2E-005		1.4E-006	1.3E-005	Arsenic	circulatory system	2.9E-001		3.6E-002	3.3E-001			
			Barium					Barium	NA	9.2E-003		1.1E-003	1.0E-002			
			Benzene	2.3E-006		9.6E-006	1.2E-005	Benzene	blood disorders	3.0E-001		1.2E+000	1.5E+000			
			Beryllium					Beryllium	kidney	2.7E-004		3.2E-003	3.5E-003			
			bis(2-Chloroethyl)Ether	1.5E-005		8.0E-006	2.3E-005	bis(2-Chloroethyl)Ether	reproductive							
			Chloroethane	1.5E-008		2.0E-008	3.6E-008	Chloroethane	liver	1.5E-004		2.0E-004	3.4E-004			
			Chromium					Chromium		1.8E-002		2.1E-002	3.9E-002			
			Ethylbenzene					Ethylbenzene	liver	1.2E-004		1.9E-003	2.0E-003			
			Iron					Iron		9.3E-002		1.1E-002	1.0E-001			
			Isophorone	8.3E-010		8.7E-010	1.7E-009	Isophorone	kidney	4.9E-005		5.1E-005	1.0E-004			
			Lead					Lead	CNS							
			Manganese					Manganese	kidney	9.7E-002		1.1E-002	1.1E-001			
			Nickel					Nickel	low body wt	7.8E-003		1.8E-003	9.6E-003			
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.3E-003			2.3E-003			
			Phenol					Phenol	liver	7.5E-005		7.9E-005	1.5E-004			
			Toluene					Toluene	liver	6.8E-005		5.9E-004	6.6E-004			
			Xylene (total)					Xylene (total)	fetotoxic	3.4E-005		5.3E-004	5.7E-004			
			Zinc					Zinc	thyroid	3.5E-004		8.0E-005	4.3E-004			
						(Total)	2.9E-005		1.9E-005	4.8E-005	(Total)		8.4E-001		1.3E+000	2.2E+000
							Total Risk Across Surface Water				4.8E-005					Total Hazard Index Across All Exposure Routes

Total Circulatory System HI =	3.3E-001
Total Kidney HI =	1.1E-001
Total Fetus HI =	1.1E-002
Total Liver HI =	6.5E-003
Total Blood Disorders HI =	1.5E+000

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

Table 6-2-10  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

File: FWORK2CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure			
Surface Water	Surface Water	Ditch Area 2	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	1.7E-005		2.6E-005	4.3E-005			
			1,2-Dichloroethene(total)					1,2-Dichloroethene(total)	kidney	5.7E-004		9.6E-004	1.5E-003			
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	1.0E-003		3.0E-003	4.0E-003			
			2-Butanone (MEK)					2-Butanone (MEK)	liver	4.0E-004		6.9E-005	4.7E-004			
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver	1.7E-004		3.1E-004	4.8E-004			
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	1.1E-003		7.2E-004	1.8E-003			
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory	3.1E-003		8.6E-003	1.2E-002			
			Acetone					Acetone	fetotoxic	6.5E-003		6.6E-004	7.2E-003			
			Aluminum					Aluminum	circulatory system	8.1E-004		8.1E-005	8.9E-004			
			Ammonia					Ammonia	kidney							
			Arsenic	2.1E-006		2.2E-007	2.3E-006	Arsenic	circulatory system	2.6E-001		2.7E-002	2.8E-001			
			Barium					Barium	NA	8.1E-003		8.1E-004	8.9E-003			
			Benzene	4.1E-007		1.4E-006	1.9E-006	Benzene	blood disorders	2.6E-001		9.3E-001	1.2E+000			
			Beryllium					Beryllium	kidney	2.4E-004		2.4E-003	2.6E-003			
			bis(2-Chloroethyl)Ether	2.6E-006		1.2E-006	3.8E-006	bis(2-Chloroethyl)Ether	reproductive							
			Chloroethane	2.7E-009			2.7E-009	Chloroethane	liver	1.3E-004		1.5E-004	2.8E-004			
			Chromium					Chromium		1.6E-002		1.6E-002	3.2E-002			
			Ethylbenzene					Ethylbenzene	liver	1.0E-004		1.4E-003	1.5E-003			
			Iron					Iron		8.2E-002		8.2E-003	9.0E-002			
			Isophorone	1.5E-010		1.3E-010	2.8E-010	Isophorone	kidney	4.3E-005		3.9E-005	8.2E-005			
			Lead					Lead	CNS							
			Manganese					Manganese	kidney	8.5E-002		8.5E-003	9.3E-002			
			Nickel					Nickel	low body wt	6.9E-003		1.4E-003	8.2E-003			
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.1E-003			2.1E-003			
			Phenol					Phenol	liver	6.6E-005		6.0E-005	1.3E-004			
			Toluene					Toluene	liver	6.0E-005		4.5E-004	5.1E-004			
			Xylene (total)					Xylene (total)	fetotoxic	3.0E-005		4.0E-004	4.3E-004			
			Zinc					Zinc	thyroid	3.0E-004		6.1E-005	3.6E-004			
						(Total)	5.1E-006		2.9E-006	8.0E-006	(Total)		7.3E-001		1.0E+000	1.7E+000
			Total Risk Across Surface Water							8.0E-006	Total Hazard Index Across All Exposure Routes					1.7E+000

Total Circulatory System HI =	2.9E-001
Total Kidney System HI =	9.8E-002
Total Fetus HI =	9.7E-003
Total Liver HI =	5.2E-003
Total Blood Disorders HI =	1.2E+000

Table 6-2-11  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: Area2RME.wk4 \ TT\_sum \CWA2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 4')	1,1-Dichloroethene	--	--	--	--	1,1-Dichloroethene	--	--	--	--	--
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	8.1E+000	--	9.8E+001	1.1E+002
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	1.1E-002	--	1.4E-001	1.5E-001
			2-Butanone	--	--	--	--	2-Butanone	liver	5.2E-001	--	6.7E+000	7.2E+000
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.1E-002	--	1.3E-001	1.5E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.4E-002	--	1.7E-001	1.9E-001
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	1.2E-002	--	1.4E-001	1.5E-001
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	2.2E-002	--	2.6E-001	2.8E-001
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	4.0E-001	--	4.8E+000	5.2E+000
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	1.8E-001	--	3.3E+000	3.5E+000
			Acetone	--	--	--	--	Acetone	fetotoxic	1.2E+001	--	1.9E+002	2.0E+002
			Aluminum	--	--	--	--	Aluminum	circulatory	4.0E-002	--	4.9E-001	5.3E-001
			Antimony	--	--	--	--	Antimony	skin	2.0E+000	--	2.4E+003	2.4E+003
			Aroclor-1248	3.5E-005	--	4.2E-004	4.5E-004	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	4.8E-007	--	7.2E-006	7.2E-006	Aroclor-1254	liver	1.2E+000	--	1.6E+001	1.7E+001
			Aroclor-1260	6.5E-006	--	7.9E-005	8.5E-005	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	6.1E-007	--	7.8E-006	8.4E-006	Arsenic	circulatory	1.3E-001	--	1.6E+000	1.7E+000
			Barium	--	--	--	--	Barium	--	1.9E-001	--	2.3E+000	2.5E+000
			Benzene	1.4E-004	--	1.8E-003	2.0E-003	Benzene	blood disorders	1.5E+002	--	2.0E+003	2.1E+003
			bis(2-Ethylhexyl)phthalate	1.8E-007	--	2.1E-006	2.3E-006	bis(2-Ethylhexyl)phthalate	liver	5.8E-002	--	7.1E-001	7.7E-001
			Cadmium	--	--	--	--	Cadmium	kidney	5.2E-001	--	2.5E+002	2.5E+002
			Chloroform	9.9E-006	--	1.3E-004	1.4E-004	Chloroform	circulatory	1.5E+001	--	1.9E+002	2.1E+002
			Chromium 3+	--	--	--	--	Chromium 3+	liver	4.8E-003	--	1.5E+001	1.5E+001
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	6.9E-005	--	8.3E-004	9.0E-004
			Cobalt	--	--	--	--	Cobalt	heart	2.7E-003	--	3.3E-002	3.5E-002
			Copper	--	--	--	--	Copper	liver	1.8E-001	--	3.3E+000	3.4E+000
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	5.4E-005	--	6.5E-004	7.1E-004
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	4.1E-003	--	5.1E-002	5.5E-002
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	3.8E-001	--	5.0E+000	5.4E+000
			Iron	--	--	--	--	Iron	--	3.1E-001	--	3.8E+000	4.1E+000
			Isophorone	1.0E-008	--	1.3E-007	1.4E-007	Isophorone	kidney	5.2E-003	--	6.2E-002	6.7E-002
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	9.9E-002	--	1.2E+000	1.3E+000
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methylene Chloride	7.9E-012	--	1.7E-010	1.8E-010	Methylene Chloride	liver	1.8E-006	--	3.6E-005	3.8E-005
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	7.9E-008	--	1.1E-006	1.1E-006
			Naphthalene	--	--	--	--	Naphthalene	circulatory	3.4E-002	--	4.2E-001	4.5E-001
			Nickel	--	--	--	--	Nickel	low body wt	1.3E-002	--	3.2E+000	3.2E+000
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	2.9E-008	--	4.0E-007	4.2E-007
			Phenol	--	--	--	--	Phenol	liver	1.4E-003	--	1.7E-002	1.8E-002
			Selenium	--	--	--	--	Selenium	liver	8.2E-003	--	9.9E-002	1.1E-001
			Silver	--	--	--	--	Silver	skin	3.4E-002	--	2.0E+000	2.0E+000
			Tetrachloroethene	1.3E-004	--	1.6E-003	1.7E-003	Tetrachloroethene	liver	2.3E+001	--	2.8E+002	3.0E+002
			Toluene	--	--	--	--	Toluene	liver	6.4E+000	--	7.7E+001	8.4E+001
			Trichloroethene	2.0E-007	--	2.5E-006	2.7E-006	Trichloroethene	liver	2.9E-001	--	3.5E+000	3.8E+000
			Vanadium	--	--	--	--	Vanadium	circulatory	8.6E-003	--	1.0E-001	1.1E-001
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	8.9E-001	--	9.3E+000	1.0E+001
			Zinc	--	--	--	--	Zinc	thyroid	1.4E-001	--	5.5E+000	5.6E+000
			(total)	3.2E-004	--	4.0E-003	4.3E-003	(total)	--	2.2E+002	--	5.6E+003	5.8E+003
AIR	AIR	Area 2, Soil (2' to 4')	1,1-Dichloroethene	--	--	--	--	1,1-Dichloroethene	--	--	--	--	--
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	5.6E-003	--	5.8E-003
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	6.9E-002	--	6.9E-002
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	3.7E-007	--	3.7E-007
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	2.1E+000	--	2.1E+000
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	3.0E-002	--	3.0E-002
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--



Table 6-2-11  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: Area2RME.wk4\TT\_sum\_fcWa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Antimony	--		--		Antimony					
			Aroclor-1248	--	4.5E-009	--	4.5E-009	Aroclor-1248					
			Aroclor-1254	--	3.4E-009	--	3.4E-009	Aroclor-1254					
			Aroclor-1260	--	3.0E-008	--	3.0E-008	Aroclor-1260					
			Arsenic	--	3.7E-009	--	3.7E-009	Arsenic	respiratory				
			Barium	--		--		Barium	fetotoxic		9.6E-004	--	9.6E-004
			Benzene	--	5.7E-006	--	5.7E-006	Benzene	blood disorders		3.2E-001	--	3.2E-001
			bis(2-Ethylhexyl)phthalate	--	2.6E-010	--	2.6E-010	bis(2-Ethylhexyl)phthalate					
			Chromium 3+	--		--		Chromium 3+					
			Chromium 6+	--	4.0E-007	--	4.0E-007	Chromium 6+	respiratory				
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene					
			Cobalt	--		--		Cobalt					
			Copper	--		--		Copper					
			Dimethylphthalate	--		--		Dimethylphthalate					
			Di-n-butylphthalate	--		--		Di-n-butylphthalate					
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory		7.9E-003	--	7.9E-003
			Isophorone	--		--		Isophorone					
			Lead	--		--		Lead					
			Manganese	--		--		Manganese	respiratory		2.7E-003	--	2.7E-003
			Mercury	--		--		Mercury	CNS		1.2E-005	--	1.2E-005
			Methylene Chloride	--	1.5E-006	--	1.5E-006	Methylene Chloride	respiratory		2.9E-003	--	2.9E-003
			m,p-xylene	--		--		m,p-xylene					
			Naphthalene	--		--		Naphthalene	circulatory		3.6E-001	--	3.6E-001
			Nickel	--		--		Nickel	respiratory				
			ortho-xylene	--		--		ortho-xylene					
			Phenol	--		--		Phenol					
			Selenium	--		--		Selenium					
			Silver	--		--		Silver					
			Tetrachloroethene	--	3.5E-006	--	3.5E-006	Tetrachloroethene	liver		3.5E-002	--	3.5E-002
			Toluene	--		--		Toluene	CNS		2.1E-001	--	2.1E-001
			Trichloroethene	--	6.0E-006	--	6.0E-006	Trichloroethene	respiratory				
			Vanadium	--		--		Vanadium					
			Xylenes (total)	--		--		Xylenes (total)	CNS				
			Zinc	--		--		Zinc					
					6.54E-005		6.5E-005	(total)			9.8E+000		9.8E+000
Total Risk Across Subsurface Soil							4.4E-003	s Subsurface Soil					5.8E+003
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	2.5E+002
Total Skin HI:	2.4E+003
Total Thyroid HI:	5.6E+000
Total Liver HI:	5.6E+002
Total Circulatory System HI:	2.1E+002
Total CNS HI:	2.6E+000
Total Fetotoxic HI:	2.1E+002
Total GI Tract HI:	1.9E+001
Total Respiratory HI:	3.5E+000
Total Eyes HI:	0.0E+000
Total Reproductive HI:	0.0E+000
Total Mammary HI:	0.0E+000
Total Adrenal HI:	0.0E+000
Total Heart HI:	3.5E-002
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	5.6E+000
Total Blood Disorders HI:	2.1E+003

Table 6-2-12  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area2RME wk4 1 TT Run: RCW10a2R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	6.4E-004	--	7.7E-003	8.4E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	1.6E-002	--	1.9E-001	2.1E-001
			1,1,2,2-Tetrachloroethane	3.8E-010	--	6.5E-009	6.9E-009	1,1,2,2-Tetrachloroethane	liver	2.9E-006	--	5.1E-005	5.4E-005
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	1.1E-002	--	1.4E-001	1.5E-001
			1,2-Dichloroethane	8.6E-008	--	1.0E-006	1.1E-006	1,2-Dichloroethane	fetotoxic	2.9E-003	--	3.6E-002	3.9E-002
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	kidney	1.9E-002	--	2.2E-001	2.4E-001
			1,2-Dichloropropane	9.7E-009	--	1.2E-007	1.3E-007	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	4.9E-003	--	5.9E-002	6.4E-002
			1,4-Dichlorobenzene	1.1E-009	--	1.4E-008	1.5E-008	1,4-Dichlorobenzene	GI tract	1.5E-004	--	1.8E-003	1.9E-003
			2-Butanone	--	--	--	--	2-Butanone	liver	3.7E-002	--	4.7E-001	5.1E-001
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.1E-002	--	1.3E-001	1.5E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.3E-001	--	1.5E+000	1.7E+000
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	1.2E-002	--	1.4E-001	1.5E-001
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	2.2E-002	--	2.6E-001	2.8E-001
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	2.2E-002	--	2.7E-001	2.9E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	1.8E-001	--	3.3E+000	3.5E+000
			4,4'-DDD	4.2E-008	--	5.0E-007	5.5E-007	4,4'-DDD	liver	--	--	--	--
			4,4'-DDE	1.6E-008	--	1.9E-007	2.1E-007	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	3.0E-008	--	3.7E-007	4.0E-007	4,4'-DDT	fetotoxic	1.7E-002	--	2.0E-001	2.2E-001
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	1.2E-003	--	1.5E-002	1.6E-002
			Acetone	--	--	--	--	Acetone	fetotoxic	5.9E-002	--	9.1E-001	9.7E-001
			Aldrin	6.9E-006	--	8.3E-005	9.0E-005	Aldrin	liver	1.3E+000	--	1.5E+001	1.6E+001
			alpha-BHC	1.1E-007	--	1.3E-006	1.4E-006	alpha-BHC	liver	--	--	--	--
			Aluminum	--	--	--	--	Aluminum	circulatory	4.0E-002	--	4.9E-001	5.3E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	2.1E-005	--	2.6E-004	2.8E-004
			Antimony	--	--	--	--	Antimony	skin	2.0E+000	--	2.4E+003	2.4E+003
			Aroclor-1248	--	--	--	--	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	3.8E-006	--	5.1E-005	5.5E-005	Aroclor-1254	liver	8.8E+000	--	1.2E+002	1.3E+002
			Aroclor-1260	3.6E-004	--	4.3E-003	4.7E-003	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	6.1E-007	--	7.8E-006	8.4E-006	Arsenic	circulatory	1.3E-001	--	1.6E+000	1.7E+000
			Barium	--	--	--	--	Barium	--	1.9E-001	--	2.3E+000	2.5E+000
			Benzene	1.5E-007	--	2.0E-006	2.1E-006	Benzene	blood disorders	1.6E-001	--	2.1E+000	2.3E+000
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	2.9E-004	--	3.6E-003	3.9E-003
			Benzo(a)anthracene	1.0E-007	--	1.3E-006	1.4E-006	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	5.8E-007	--	8.2E-006	8.8E-006	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	2.0E-007	--	2.5E-006	2.7E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	2.0E-008	--	2.5E-007	2.7E-007	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	CNS	5.6E-004	--	6.7E-003	7.3E-003
			Beryllium	--	--	--	--	Beryllium	kidney	8.3E-004	--	1.0E+000	1.0E+000
			beta-BHC	7.6E-008	--	9.2E-007	9.9E-007	beta-BHC	liver	--	--	--	--
			bis(2-Chloroethyl) ether	6.4E-006	--	7.7E-005	8.3E-005	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	1.7E-006	--	2.0E-005	2.2E-005	bis(2-Ethylhexyl)phthalate	liver	5.6E-001	--	6.8E+000	7.4E+000
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	1.0E-002	--	1.2E-001	1.3E-001
			Cadmium	--	--	--	--	Cadmium	kidney	5.2E-001	--	2.5E+002	2.5E+002
			Chloroform	4.5E-008	--	5.7E-007	6.1E-007	Chloroform	circulatory	6.9E-002	--	8.7E-001	9.4E-001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	4.8E-003	--	1.5E+001	1.5E+001
			Chrysene	1.5E-009	--	4.3E-008	4.4E-008	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	1.1E-004	--	1.4E-003	1.5E-003
			Cobalt	--	--	--	--	Cobalt	heart	2.7E-003	--	3.3E-002	3.5E-002
			Copper	--	--	--	--	Copper	liver	1.6E-001	--	3.3E+000	3.4E+000
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	3.1E-003	--	3.7E-002	4.0E-002
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	3.9E-004	--	4.7E-003	5.1E-003
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	1.3E-004	--	1.5E-003	1.7E-003
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	1.9E-002	--	2.4E-001	2.6E-001
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	3.2E-003	--	3.9E-002	4.2E-002
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	3.3E-002	--	4.4E-001	4.7E-001
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	5.0E-004	--	6.1E-003	6.6E-003

Table 6-2-12  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area2RME wk4 1 TT sum ICW10a2R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Fluorene		--			Fluorene	skeletal	2.2E-003	--	2.7E-002	2.9E-002
			Hexachlorobutadiene	3.8E-009	--	4.6E-008	5.0E-008	Hexachlorobutadiene	low body wt	2.3E-002	--	2.8E-001	3.0E-001
			Indeno(1,2,3-cd)pyrene	5.4E-008	--	6.5E-007	7.0E-007	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Iron		--			Iron		3.1E-001	--	3.8E+000	4.1E+000
			Isophorone	9.0E-008	--	1.1E-006	1.2E-006	Isophorone	kidney	4.4E-002	--	5.3E-001	5.8E-001
			Lead		--			Lead	CNS	--	--	--	--
			Manganese		--			Manganese	kidney	9.9E-002	--	1.2E+000	1.3E+000
			Mercury		--			Mercury	low body wt	--	--	--	--
			Methylene Chloride	2.7E-008	--	5.9E-007	6.2E-007	Methylene Chloride	liver	5.6E-003	--	1.2E-001	1.3E-001
			m,p-xylene		--			m,p-xylene	fetotoxic	1.2E-005	--	1.6E-004	1.7E-004
			Naphthalene		--			Naphthalene	circulatory	1.2E-001	--	1.5E+000	1.6E+000
			Nickel		--			Nickel	low body wt	1.4E-002	--	3.3E+000	3.3E+000
			ortho-xylene		--			ortho-xylene	fetotoxic	6.1E-006	--	8.2E-005	8.9E-005
			Pentachlorophenol	4.0E-007	--	4.8E-006	5.2E-006	Pentachlorophenol	liver	1.0E-002	--	1.2E-001	1.3E-001
			Phenol		--			Phenol	liver	1.4E-003	--	1.7E-002	1.8E-002
			Pyrene		--			Pyrene	liver	1.3E-003	--	1.6E-002	1.7E-002
			Selenium		--			Selenium	liver	8.2E-003	--	9.9E-002	1.1E-001
			Silver		--			Silver	skin	3.4E-002	--	2.0E+000	2.0E+000
			Styrene		--			Styrene	liver	1.3E-003	--	1.5E-002	1.7E-002
			Tetrachloroethene	2.4E-006	--	2.9E-005	3.1E-005	Tetrachloroethene	liver	4.3E-001	--	5.2E+000	5.7E+000
			Thallium		--			Thallium		1.0E-001	--	1.2E+000	1.3E+000
			Toluene		--			Toluene	liver	3.2E-002	--	3.9E-001	4.2E-001
			Trichloroethene	2.0E-007	--	2.5E-006	2.7E-006	Trichloroethene	liver	2.9E-001	--	3.5E+000	3.8E+000
			Vanadium		--			Vanadium	circulatory	8.6E-003	--	1.0E-001	1.1E-001
			Vinyl Chloride	1.1E-008	--	1.3E-007	1.4E-007	Vinyl Chloride	liver	--	--	--	--
			Xylenes (total)		--			Xylenes (total)	fetotoxic	8.8E-003	--	1.2E-001	1.3E-001
			Zinc		--			Zinc	thyroid	1.4E-001	--	5.5E+000	5.8E+000
			(Total)	4.2E-004	--	5.0E-003	5.5E-003	(Total)		1.6E+001	--	2.9E+003	2.9E+003
Air	Area 2, Soil (2' to 10')		1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	8.00E-003	--	8.0E-003
			1,1-Dichloroethene	--	--	--	--	1,1-Dichloroethene		--	--	--	--
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	4.72E-003	--	4.7E-003
			1,1,2-Trichloroethane	--	3.24E-009	--	3.2E-009	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.15E-009	--	1.2E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	8.51E-002	--	8.5E-002
			1,2-Dichloroethane	--	3.73E-007	--	3.7E-007	1,2-Dichloroethane	circulatory	--	2.73E-001	--	2.7E-001
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane		--	1.44E-001	--	1.4E-001
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	7.62E-004	--	7.6E-004
			1,4-Dichlorobenzene	--	3.38E-009	--	3.4E-009	1,4-Dichlorobenzene	liver	--	6.27E-005	--	6.3E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	1.32E-003	--	1.3E-003
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	2.56E+000	--	2.6E+000
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol		--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene		--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	5.03E-002	--	5.0E-002
			4-Methylphenol	--	--	--	--	4-Methylphenol		--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE		--	--	--	--
			4,4'-DDT	--	6.00E-010	--	6.0E-010	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene		--	--	--	--
			Acetone	--	--	--	--	Acetone		--	--	--	--
			Aldrin	--	1.37E-007	--	1.4E-007	Aldrin		--	--	--	--
			alpha-BHC	--	2.28E-009	--	2.3E-009	alpha-BHC		--	--	--	--
			Anthracene	--	--	--	--	Anthracene		--	--	--	--
			Antimony	--	--	--	--	Antimony		--	--	--	--
			Aroclor-1242	--	1.53E-008	--	1.5E-008	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	6.00E-007	--	6.0E-007	Aroclor-1248		--	--	--	--

Table 6-2-12  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area2RME.wk41 TT\_sum ICW10a2R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Aroclor-1254	--	7.89E-008	--	7.9E-008	Aroclor-1254		--		--	
			Aroclor-1260	--	6.11E-006	--	6.1E-006	Aroclor-1260		--		--	
			Arsenic	--	1.19E-007	--	1.2E-007	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	teratotoxic	--		--	
			Benzene	--	3.83E-007	--	3.8E-007	Benzene	blood disorders	--	1.71E+000	--	1.7E+000
			Benzoic Acid	--		--		Benzoic Acid		--	7.24E-001	--	7.2E-001
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	5.10E-009	--	5.1E-009	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	3.08E-009	--	3.1E-009	Beryllium	respiratory	--	6.01E-003	--	6.0E-003
			beta-BHC	--	1.51E-009	--	1.5E-009	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	1.73E-006	--	1.7E-006	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	2.93E-008	--	2.9E-008	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	7.32E-007	--	7.3E-007	Cadmium		--		--	
			Chlorobenzene	--		--		Chlorobenzene	liver	--	4.09E-004	--	4.1E-004
			Chloroform	--	1.36E-006	--	1.4E-006	Chloroform	liver	--	1.83E+001	--	1.8E+001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	9.50E-006	--	9.5E-006	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	2.03E-002	--	2.0E-002
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Hexachlorobenzene	--	1.30E-009	--	1.3E-009	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	4.34E-009	--	4.3E-009	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	2.64E+000	--	2.6E+000
			Mercury	--		--		Mercury	CNS	--	9.34E-003	--	9.3E-003
			Methylene Chloride	--	2.52E-008	--	2.5E-008	Methylene Chloride	respiratory	--	1.66E-003	--	1.7E-003
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	4.55E-001	--	4.5E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	5.39E-004	--	5.4E-004
			Tetrachloroethene	--	2.33E-007	--	2.3E-007	Tetrachloroethene	liver	--	7.76E-002	--	7.8E-002
			Thallium	--		--		Thallium		--		--	

Table 6-2-12  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area2RME wk4\TT\_sum\_ICW10a2R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene	--		--	2.3E-007	Toluene	CNS	--	3.08E-001	--	3.1E-001
			Trichloroethene	--	2.30E-007	--		Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	9.21E-008	--	9.2E-008	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		2.2E-005		2.2E-005	(total)			2.7E+001		2.7E+001
Total Risk Across Subsurface Soil							5.5E-003	Total Hazard Index Across Subsurface Soil					2.9E+003
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	2.6E+002
Total Skin HI:	2.4E+003
Total Thyroid HI:	5.6E+000
Total Liver HI:	2.0E+002
Total Circulatory System HI:	5.6E+000
Total CNS HI:	3.4E+000
Total Fetotoxic HI:	3.1E+000
Total GI Tract HI:	1.7E+000
Total Respiratory HI:	6.1E+000
Total Eyes HI:	1.6E-002
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.3E-001
Total Adrenal HI:	0.0E+000
Total Heart HI:	3.5E-002
Total Skeletal System HI:	2.9E-002
Total Thyroid HI:	5.6E+000
Total Blood Disorders HI:	3.0E+000

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Table 6-2-13  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

File: Area2RME.wk4 \ TT\_sum\_cTa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 4')	1,1-Dichloroethene	--	--	--	--	1,1-Dichloroethene	--	--	--	--	--
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	8.4E-001	--	3.7E+001	3.8E+001
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	1.2E-003	--	5.2E-002	5.3E-002
			2-Butanone	--	--	--	--	2-Butanone	liver	5.4E-002	--	2.5E+000	2.6E+000
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.2E-003	--	5.1E-002	5.2E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.5E-003	--	6.5E-002	6.6E-002
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	1.2E-003	--	5.4E-002	5.5E-002
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	2.2E-003	--	9.8E-002	1.0E-001
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	4.1E-002	--	1.8E+000	1.9E+000
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	1.8E-002	--	1.2E+000	1.3E+000
			Acetone	--	--	--	--	Acetone	fetotoxic	1.3E+000	--	7.1E+001	7.2E+001
			Aluminum	--	--	--	--	Aluminum	circulatory	4.2E-003	--	1.8E-001	1.9E-001
			Antimony	--	--	--	--	Antimony	skin	2.1E-001	--	9.2E+002	9.2E+002
			Aroclor-1248	2.8E-005	--	1.2E-003	1.3E-003	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	4.0E-007	--	2.0E-005	2.0E-005	Aroclor-1254	liver	1.2E-001	--	5.9E+000	6.0E+000
			Aroclor-1260	5.2E-006	--	2.3E-004	2.4E-004	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	4.9E-007	--	2.3E-005	2.3E-005	Arsenic	circulatory	1.3E-002	--	6.1E-001	6.2E-001
			Barium	--	--	--	--	Barium	--	1.9E-002	--	8.6E-001	8.8E-001
			Benzene	1.1E-004	--	5.3E-003	5.4E-003	Benzene	blood disorders	1.5E+001	--	7.4E+002	7.5E+002
			bis(2-Ethylhexyl)phthalate	1.4E-007	--	6.2E-006	6.4E-006	bis(2-Ethylhexyl)phthalate	liver	6.1E-003	--	2.7E-001	2.7E-001
			Cadmium	--	--	--	--	Cadmium	kidney	5.4E-002	--	9.5E+001	9.5E+001
			Chloroform	8.0E-006	--	3.7E-004	3.8E-004	Chloroform	circulatory	1.6E+000	--	7.2E+001	7.4E+001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	5.0E-004	--	5.5E+000	5.5E+000
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	7.1E-006	--	3.1E-004	3.2E-004
			Cobalt	--	--	--	--	Cobalt	heart	2.6E-004	--	1.2E-002	1.3E-002
			Copper	--	--	--	--	Copper	liver	1.7E-002	--	1.2E+000	1.2E+000
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	5.6E-006	--	2.5E-004	2.5E-004
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	4.3E-004	--	1.9E-002	2.0E-002
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	4.0E-002	--	1.9E+000	1.9E+000
			Iron	--	--	--	--	Iron	--	3.2E-002	--	1.4E+000	1.5E+000
			Isophorone	8.4E-009	--	3.7E-007	3.8E-007	Isophorone	kidney	5.3E-004	--	2.3E-002	2.4E-002
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	1.0E-002	--	4.5E-001	4.6E-001
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methylene Chloride	6.3E-012	--	5.1E-010	5.1E-010	Methylene Chloride	liver	1.7E-007	--	1.4E-005	1.4E-005
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	8.1E-009	--	4.0E-007	4.0E-007
			Naphthalene	--	--	--	--	Naphthalene	circulatory	3.6E-003	--	1.6E-001	1.6E-001
			Nickel	--	--	--	--	Nickel	low body wt	1.4E-003	--	1.2E+000	1.2E+000
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	3.0E-009	--	1.5E-007	1.5E-007
			Phenol	--	--	--	--	Phenol	liver	1.4E-004	--	6.3E-003	6.5E-003
			Selenium	--	--	--	--	Selenium	liver	8.4E-004	--	3.7E-002	3.8E-002
			Silver	--	--	--	--	Silver	skin	3.5E-003	--	7.4E-001	7.5E-001
			Tetrachloroethene	1.0E-004	--	4.5E-003	4.6E-003	Tetrachloroethene	liver	2.4E+000	--	1.0E+002	1.1E+002
			Toluene	--	--	--	--	Toluene	liver	6.6E-001	--	2.8E+001	3.0E+001
			Trichloroethene	1.6E-007	--	7.3E-006	7.5E-006	Trichloroethene	liver	3.0E-002	--	1.3E+000	1.4E+000
			Vanadium	--	--	--	--	Vanadium	circulatory	8.6E-004	--	3.9E-002	4.0E-002
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	7.1E-002	--	3.5E+000	3.6E+000
			Zinc	--	--	--	--	Zinc	thyroid	1.4E-002	--	2.1E+000	2.1E+000
			(Total)	2.5E-004	--	1.2E-002	1.2E-002	(Total)	--	2.3E+001	--	2.1E+003	2.1E+003
AIR	AIR	Area 2, Soil (2' to 4')	1,1-Dichloroethene	--	--	--	--	1,1-Dichloroethene	kidney	--	1.04E-004	--	1.0E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	5.89E-005	--	5.9E-005
			1,1,2-Trichloroethane	--	1.09E-012	--	1.1E-012	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	3.12E-010	--	3.1E-010	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	2.92E-003	--	2.9E-003
			1,2-Dichloroethane	--	4.41E-008	--	4.4E-008	1,2-Dichloroethane	circulatory	--	4.15E-003	--	4.2E-003
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	5.05E-003	--	5.0E-003
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	2.37E-005	--	2.4E-005
			1,4-Dichlorobenzene	--	9.17E-010	--	9.2E-010	1,4-Dichlorobenzene	liver	--	2.18E-006	--	2.2E-006
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	9.19E-009	--	9.2E-009
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	8.95E-002	--	8.9E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--

Table 6-2-13  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population	Trespasser
Receptor Age	Adolescent

File: Area2RME.wk4 \ TT\_sum\_cTa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	7.43E-004	--	7.4E-004
			4-Methylphenol	--	--	--	--	4-Methylphenol		--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE		--	--	--	--
			4,4'-DDT	--	1.87E-013	--	1.9E-013	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene		--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene		--	--	--	--
			Acetone	--	--	--	--	Acetone		--	--	--	--
			Aldrin	--	4.53E-011	--	4.5E-011	Aldrin		--	--	--	--
			alpha-BHC	--	9.18E-013	--	9.2E-013	alpha-BHC		--	--	--	--
			Anthracene	--	--	--	--	Anthracene		--	--	--	--
			Antimony	--	--	--	--	Antimony		--	--	--	--
			Aroclor-1242	--	5.16E-013	--	5.2E-013	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	4.41E-011	--	4.4E-011	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	3.23E-011	--	3.2E-011	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	3.05E-010	--	3.1E-010	Aroclor-1260		--	--	--	--
			Arsenic	--	4.30E-011	--	4.3E-011	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	4.15E-005	--	4.1E-005
			Benzene	--	3.61E-008	--	3.8E-008	Benzene	blood disorders	--	8.78E-003	--	8.8E-003
			Benzoic Acid	--	--	--	--	Benzoic Acid		--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	2.06E-012	--	2.1E-012	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene		--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol		--	--	--	--
			Beryllium	--	2.21E-012	--	2.2E-012	Beryllium	respiratory	--	5.53E-007	--	5.5E-007
			beta-BHC	--	4.99E-013	--	5.0E-013	beta-BHC		--	--	--	--
			bis(2-Chloroethyl) ether	--	4.43E-007	--	4.4E-007	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	2.25E-012	--	2.2E-012	bis(2-Ethylhexyl)phthalate		--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate		--	--	--	--
			Cadmium	--	3.16E-010	--	3.2E-010	Cadmium		--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide		--	1.76E-010	--	1.8E-010
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	6.55E-005	--	6.6E-005
			Chloroform	--	1.37E-007	--	1.4E-007	Chloroform	liver	--	2.36E-001	--	2.4E-001
			Chromium 3+	--	--	--	--	Chromium 3+		--	--	--	--
			Chromium 6+	--	3.99E-009	--	4.0E-009	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene		--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene		--	--	--	--
			Cobalt	--	--	--	--	Cobalt		--	--	--	--
			Copper	--	--	--	--	Copper		--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)		--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran		--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate		--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate		--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate		--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate		--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone		--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	3.06E-004	--	3.1E-004
			Fluoranthene	--	--	--	--	Fluoranthene		--	--	--	--
			Fluorene	--	--	--	--	Fluorene		--	--	--	--
			Heptachlor	--	8.02E-015	--	8.0E-015	Heptachlor		--	--	--	--
			Heptachlor epoxide	--	7.74E-015	--	7.7E-015	Heptachlor epoxide		--	--	--	--
			Hexachlorobenzene	--	1.40E-015	--	1.4E-015	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	4.71E-013	--	4.7E-013	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Isophorone	--	--	--	--	Isophorone		--	--	--	--
			Lead	--	--	--	--	Lead		--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	1.45E-004	--	1.5E-004
			Mercury	--	--	--	--	Mercury	CNS	--	5.27E-007	--	5.3E-007

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Table 6-2-13  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

File: Area2RME.wk4 \ TT\_sum\_cTa2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Methylene Chloride	--	6.86E-009	--	6.9E-009	Methylene Chloride	respiratory	--	5.80E-005	--	5.8E-005
			m,p-xylene	--	--	--	--	m,p-xylene	circulatory	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	respiratory	--	1.45E-002	--	1.4E-002
			Nickel	--	--	--	--	Nickel	--	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--
			Silver	--	--	--	--	Silver	--	--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	1.20E-005	--	1.2E-005
			Tetrachloroethene	--	3.43E-008	--	3.4E-008	Tetrachloroethene	liver	--	1.47E-003	--	1.5E-003
			Thallium	--	--	--	--	Thallium	--	--	--	--	--
			Toluene	--	--	--	--	Toluene	CNS	--	8.65E-003	--	8.7E-003
			Trichloroethene	--	3.07E-008	--	3.1E-008	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	--	--	--	--	--
			Vinyl Chloride	--	1.93E-008	--	1.9E-008	Vinyl Chloride	CNS	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc	--	--	--	--	--
			(total)		7.6E-007		7.6E-007	(total)			3.7E-001		3.7E-001
Total Risk Across Surface Soil							1.2E-002	Total Hazard Index Across Surface Soil					2.1E+003
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	9.5E+001
Total Skin HI:	9.2E+002
Total Thyroid HI:	2.1E+000
Total Liver HI:	2.0E+002
Total Circulatory System HI:	7.5E+001
Total CNS HI:	2.0E+001
Total Fetotoxic HI:	7.6E+001
Total GI Tract HI:	6.6E+002
Total Respiratory HI:	1.3E+000
Total Eyes HI:	0.0E+000
Total Reproductive HI:	0.0E+000
Total Mammary HI:	0.0E+000
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.3E+002
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	2.1E+000
Total Blood Disorders HI:	7.5E+002



Table 6-2-14  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: Area2CT.wk4 \ TT\_sum\_cTa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure			
Surface Soil	Soil	Area 2, Soil (2' to 4')	1,1-Dichloroethene		--			1,1-Dichloroethene			--					
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	2.2E-001	--	3.1E+000	3.3E+000			
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	3.1E-004	--	4.4E-003	4.7E-003			
			2-Butanone		--			2-Butanone	liver	1.4E-002	--	2.1E-001	2.3E-001			
			2-Hexanone		--			2-Hexanone	CNS	3.0E-004	--	4.3E-003	4.6E-003			
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	3.8E-004	--	5.5E-003	5.9E-003			
			2-Methylphenol		--			2-Methylphenol	liver	3.2E-004	--	4.5E-003	4.9E-003			
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	5.8E-004	--	8.3E-003	8.9E-003			
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	1.1E-002	--	1.5E-001	1.6E-001			
			4-Methylphenol		--			4-Methylphenol	respiratory	4.7E-003	--	1.0E-001	1.1E-001			
			Acetone		--			Acetone	fetotoxic	3.3E-001	--	6.0E+000	6.4E+000			
			Aluminum		--			Aluminum	circulatory	1.1E-003	--	1.6E-002	1.7E-002			
			Antimony		--			Antimony	skin	5.4E-002	--	7.8E+001	7.8E+001			
			Aroclor-1248	6.2E-007	--	8.9E-006	9.5E-006	Aroclor-1248	liver		--					
			Aroclor-1254	8.8E-009	--	1.4E-007	1.5E-007	Aroclor-1254	liver	3.1E-002	--	5.0E-001	5.3E-001			
			Aroclor-1260	1.2E-007	--	1.7E-006	1.8E-006	Aroclor-1260	circulatory		--					
			Arsenic	1.1E-008	--	1.7E-007	1.8E-007	Arsenic	circulatory	3.4E-003	--	5.2E-002	5.5E-002			
			Barium		--			Barium		5.1E-003	--	7.3E-002	7.8E-002			
			Benzene	2.4E-006	--	3.9E-005	4.1E-005	Benzene	blood disorders	3.9E+000	--	6.2E+001	6.6E+001			
			bis(2-Ethylhexyl)phthalate	3.2E-009	--	4.5E-008	4.9E-008	bis(2-Ethylhexyl)phthalate	liver	1.6E-003	--	2.3E-002	2.4E-002			
			Cadmium		--			Cadmium	kidney	1.4E-002	--	8.0E+000	8.0E+000			
			Chloroform	1.8E-007	--	2.7E-006	2.9E-006	Chloroform	circulatory	4.1E-001	--	6.1E+000	6.6E+000			
			Chromium 3+		--			Chromium 3+	liver	1.3E-004	--	4.7E-001	4.7E-001			
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	1.8E-006	--	2.7E-005	2.8E-005			
			Cobalt		--			Cobalt	heart	7.2E-005	--	1.0E-003	1.1E-003			
			Copper		--			Copper	liver	4.3E-003	--	1.0E-001	1.1E-001			
			Dimethylphthalate		--			Dimethylphthalate	GI tract	1.4E-006	--	2.1E-005	2.2E-005			
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.1E-004	--	1.6E-003	1.8E-003			
			Ethyl Benzene		--			Ethyl Benzene	liver	1.0E-002	--	1.6E-001	1.7E-001			
			Iron		--			Iron		8.4E-003	--	1.2E-001	1.3E-001			
			Isophorone	1.9E-010	--	2.7E-009	2.9E-009	Isophorone	kidney	1.4E-004	--	2.0E-003	2.1E-003			
			Lead		--			Lead	CNS		--					
			Manganese		--			Manganese	kidney	2.6E-003	--	3.8E-002	4.1E-002			
			Mercury		--			Mercury	low body wt		--					
			Methylene Chloride	1.4E-013	--	3.7E-012	3.8E-012	Methylene Chloride	liver	4.4E-008	--	1.1E-006	1.2E-006			
			m,p-xylene		--			m,p-xylene	fetotoxic	2.1E-009	--	3.4E-008	3.6E-008			
			Naphthalene		--			Naphthalene	circulatory	9.2E-004	--	1.3E-002	1.4E-002			
			Nickel		--			Nickel	low body wt	3.5E-004	--	1.0E-001	1.0E-001			
			ortho-xylene		--			ortho-xylene	fetotoxic	7.9E-010	--	1.3E-008	1.3E-008			
			Phenol		--			Phenol	liver	3.7E-005	--	5.4E-004	5.7E-004			
			Selenium		--			Selenium	liver	2.2E-004	--	3.2E-003	3.4E-003			
			Silver		--			Silver	skin	9.2E-004	--	6.3E-002	6.4E-002			
			Tetrachloroethene	2.3E-006	--	3.3E-005	3.5E-005	Tetrachloroethene	liver	6.2E-001	--	8.9E+000	9.5E+000			
			Toluene		--			Toluene	liver	1.7E-001	--	2.5E+000	2.6E+000			
			Trichloroethene	3.6E-009	--	5.3E-008	5.7E-008	Trichloroethene	liver	7.7E-003	--	1.1E-001	1.2E-001			
			Vanadium		--			Vanadium	circulatory	2.3E-004	--	3.3E-003	3.5E-003			
			Xylenes (total)		--			Xylenes (total)	fetotoxic	1.8E-002	--	3.0E-001	3.1E-001			
			Zinc		--			Zinc	thyroid	3.6E-003	--	1.7E-001	1.8E-001			
			(Total)				5.7E-006		8.6E-005	9.1E-005	(Total)		5.8E+000		1.8E+002	1.8E+002

Table 6-2-14  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: Area2CT.wk4 \ TT\_sum\_cTa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	AIR	Area 2, Soil (2' to 4')	1,1-Dichloroethane	--		--		1,1-Dichloroethane	kidney	--	2.69E-005	--	2.7E-005
			1,1,1-Trichloroethane	--		--		1,1,1-Trichloroethane	liver	--	1.53E-005	--	1.5E-005
			1,1,2-Trichloroethane	--	2.42E-014	--	2.4E-014	1,1,2-Trichloroethane	liver	--		--	
			1,1,2,2-Tetrachloroethane	--	6.92E-012	--	6.9E-012	1,1,2,2-Tetrachloroethane	liver	--		--	
			1,2-Dichlorobenzene	--		--		1,2-Dichlorobenzene	low body weight	--	7.56E-004	--	7.6E-004
			1,2-Dichloroethane	--	9.79E-010	--	9.8E-010	1,2-Dichloroethane	circulatory	--	1.08E-003	--	1.1E-003
			1,2-Dichloroethene (total)	--		--		1,2-Dichloroethene (total)		--		--	
			1,2-Dichloropropane	--		--		1,2-Dichloropropane		--	1.31E-003	--	1.3E-003
			1,2,4-Trichlorobenzene	--		--		1,2,4-Trichlorobenzene	liver	--	6.16E-006	--	6.2E-006
			1,4-Dichlorobenzene	--	2.04E-011	--	2.0E-011	1,4-Dichlorobenzene	liver	--	5.66E-007	--	5.7E-007
			2-Butanone	--		--		2-Butanone	CNS	--	2.38E-009	--	2.4E-009
			2-Hexanone	--		--		2-Hexanone	CNS	--	2.32E-002	--	2.3E-002
			2-Methylnaphthalene	--		--		2-Methylnaphthalene		--		--	
			2-Methylphenol	--		--		2-Methylphenol		--		--	
			2,4-Dimethylphenol	--		--		2,4-Dimethylphenol		--		--	
			2,4,5-Trichlorophenol	--		--		2,4,5-Trichlorophenol		--		--	
			2,6-Dinitrotoluene	--		--		2,6-Dinitrotoluene		--		--	
			3,3'-Dichlorobenzidine	--		--		3,3'-Dichlorobenzidine		--		--	
			4-Methyl-2-pentanone	--		--		4-Methyl-2-pentanone	CNS	--	1.93E-004	--	1.9E-004
			4-Methylphenol	--		--		4-Methylphenol		--		--	
			4,4'-DDD	--		--		4,4'-DDD		--		--	
			4,4'-DDE	--		--		4,4'-DDE		--		--	
			4,4'-DDT	--	4.16E-015	--	4.2E-015	4,4'-DDT	liver	--		--	
			Acenaphthene	--		--		Acenaphthene		--		--	
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	1.01E-012	--	1.0E-012	Aldrin		--		--	
			alpha-BHC	--	2.04E-014	--	2.0E-014	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	1.15E-014	--	1.1E-014	Aroclor-1242		--		--	
			Aroclor-1248	--	9.81E-013	--	9.8E-013	Aroclor-1248		--		--	
			Aroclor-1254	--	7.18E-013	--	7.2E-013	Aroclor-1254		--		--	
			Aroclor-1260	--	6.78E-012	--	6.8E-012	Aroclor-1260		--		--	
			Arsenic	--	9.56E-013	--	9.6E-013	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--	1.08E-005	--	1.1E-005
			Benzene	--	8.02E-010	--	8.0E-010	Benzene	blood disorders	--	2.28E-003	--	2.3E-003
			Benzoic Acid	--		--		Benzoic Acid		--		--	
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	4.58E-014	--	4.6E-014	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	4.91E-014	--	4.9E-014	Beryllium	respiratory	--	1.43E-007	--	1.4E-007
			beta-BHC	--	1.11E-014	--	1.1E-014	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	9.84E-009	--	9.8E-009	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	4.99E-014	--	5.0E-014	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	

Table 6-2-14  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: Area2CT.wk4 \ TT\_sum\_cTa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Cadmium	--	7.01E-012	--	7.0E-012	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	4.57E-011	--	4.6E-011
			Chlorobenzene	--		--		Chlorobenzene	liver	--	1.70E-005	--	1.7E-005
			Chloroform	--	3.04E-009	--	3.0E-009	Chloroform	liver	--	6.11E-002	--	6.1E-002
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	8.86E-011	--	8.9E-011	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	7.93E-005	--	7.9E-005
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Heptachlor	--	1.78E-016	--	1.8E-016	Heptachlor		--		--	
			Heptachlor epoxide	--	1.72E-016	--	1.7E-016	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	3.11E-017	--	3.1E-017	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.05E-014	--	1.0E-014	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	3.76E-005	--	3.8E-005
			Mercury	--		--		Mercury	CNS	--	1.37E-007	--	1.4E-007
			Methylene Chloride	--	1.52E-010	--	1.5E-010	Methylene Chloride	respiratory	--	1.50E-005	--	1.5E-005
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	3.76E-003	--	3.8E-003
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	3.10E-006	--	3.1E-006
			Tetrachloroethene	--	7.63E-010	--	7.6E-010	Tetrachloroethene	liver	--	3.81E-004	--	3.8E-004
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	2.24E-003	--	2.2E-003
			Trichloroethene	--	6.82E-010	--	6.8E-010	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	4.29E-010	--	4.3E-010	Vinyl Chloride	CNS	--		--	

Table 6-2-14  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: Area2CT.wk4 \ TT\_sum\_cTa2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Xylenes (total)	--		--		Xylenes (total)				--	
			Zinc	--		--		Zinc	CNS	--		--	
			(total)		1.7E-008		1.7E-008	(total)			9.7E-002		9.7E-002
Total Risk Across Surface Soil								Total Hazard Index Across Surface Soil					
													1.8E+002
Total Risk Across All Media and All Exposure Routes													

Total Kidney HI:	8.1E+000
Total Skin HI:	7.8E+001
Total Thyroid HI:	1.8E-001
Total Liver HI:	1.7E+001
Total Circulatory System HI:	6.6E+000
Total CNS HI:	3.5E-002
Total Fetotoxic HI:	6.7E+000
Total GI Tract HI:	5.9E-003
Total Respiratory HI:	1.1E-001
Total Eyes HI:	0.0E+000
Total Reproductive HI:	0.0E+000
Total Mammary HI:	0.0E+000
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.1E-003
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	1.8E-001
Total Blood Disorders HI:	6.6E+001

Scenario Timeframe: Future  
 Receptor Population: Trespasser  
 Receptor Age: Adolescent

Table 6-2-15  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Arqs2RME wk41TT sum\_Ta2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	6.6E-005	--	2.9E-003	3.0E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	1.6E-003	--	7.3E-002	7.4E-002
			1,1,2,2-Tetrachloroethane	3.0E-010	--	1.9E-008	1.9E-008	1,1,2,2-Tetrachloroethane	liver	3.0E-007	--	1.9E-005	1.9E-005
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	1.2E-003	--	5.2E-002	5.3E-002
			1,2-Dichloroethane	6.9E-008	--	3.0E-006	3.1E-006	1,2-Dichloroethane	fetotoxic	3.0E-004	--	1.3E-002	1.4E-002
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	kidney	1.9E-003	--	8.4E-002	8.6E-002
			1,2-Dichloropropane	7.8E-009	--	3.4E-007	3.5E-007	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	5.1E-004	--	2.2E-002	2.3E-002
			1,4-Dichlorobenzene	9.2E-010	--	4.1E-008	4.2E-008	1,4-Dichlorobenzene	GI tract	1.5E-005	--	6.8E-004	6.9E-004
			2-Butanone	--	--	--	--	2-Butanone	liver	3.8E-003	--	1.8E-001	1.8E-001
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	1.2E-003	--	5.1E-002	5.2E-002
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	1.3E-002	--	5.8E-001	5.9E-001
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	1.2E-003	--	5.4E-002	5.5E-002
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	2.2E-003	--	9.8E-002	1.0E-001
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	2.3E-003	--	1.0E-001	1.0E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	1.8E-002	--	1.2E+000	1.3E+000
			4,4'-DDD	3.3E-008	--	1.5E-006	1.5E-006	4,4'-DDD	liver	--	--	--	--
			4,4'-DDE	1.3E-008	--	5.6E-007	5.7E-007	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	2.4E-008	--	1.1E-006	1.1E-006	4,4'-DDT	fetotoxic	1.7E-003	--	7.6E-002	7.8E-002
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	1.3E-004	--	5.6E-003	5.7E-003
			Acetone	--	--	--	--	Acetone	fetotoxic	6.1E-003	--	3.4E-001	3.5E-001
			Aldrin	5.5E-006	--	2.4E-004	2.5E-004	Aldrin	liver	1.3E-001	--	5.7E+000	5.9E+000
			alpha-BHC	8.8E-008	--	3.9E-006	4.0E-006	alpha-BHC	liver	--	--	--	--
			Aluminum	--	--	--	--	Aluminum	circulatory	4.2E-003	--	1.8E-001	1.9E-001
			Anthracene	--	--	--	--	Anthracene	GI tract	2.2E-006	--	9.7E-005	9.9E-005
			Antimony	--	--	--	--	Antimony	skin	2.1E-001	--	9.2E+002	9.2E+002
			Aroclor-1248	--	--	--	--	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	3.0E-006	--	1.5E-004	1.5E-004	Aroclor-1254	liver	9.1E-001	--	4.5E+001	4.6E+001
			Aroclor-1260	2.9E-004	--	1.3E-002	1.3E-002	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	4.9E-007	--	2.3E-005	2.3E-005	Arsenic	circulatory	1.3E-002	--	6.1E-001	6.2E-001
			Barium	--	--	--	--	Barium	--	1.9E-002	--	8.6E-001	8.8E-001
			Benzene	1.2E-007	--	5.8E-006	5.9E-006	Benzene	blood disorders	1.6E-002	--	7.9E-001	8.1E-001
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	3.0E-005	--	1.3E-003	1.4E-003
			Benzo(a)anthracene	8.3E-008	--	3.7E-006	3.7E-006	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	4.6E-007	--	2.4E-005	2.4E-005	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	1.6E-007	--	7.2E-006	7.4E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	1.6E-008	--	7.2E-007	7.4E-007	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	CNS	5.7E-005	--	2.5E-003	2.6E-003
			Beryllium	--	--	--	--	Beryllium	kidney	8.6E-005	--	3.8E-001	3.8E-001
			beta-BHC	6.1E-008	--	2.7E-006	2.7E-006	beta-BHC	liver	--	--	--	--
			bis(2-Chloroethyl) ether	5.1E-006	--	2.3E-004	2.3E-004	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	1.4E-006	--	6.0E-005	6.1E-005	bis(2-Ethylhexyl)phthalate	liver	5.8E-002	--	2.6E+000	2.6E+000
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	1.1E-003	--	4.7E-002	4.8E-002
			Cadmium	--	--	--	--	Cadmium	kidney	5.4E-002	--	9.5E+001	9.5E+001
			Chloroform	3.6E-008	--	1.7E-006	1.7E-006	Chloroform	circulatory	7.1E-003	--	3.3E-001	3.3E-001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	5.0E-004	--	5.5E+000	5.5E+000
			Chrysene	1.2E-009	--	1.3E-007	1.3E-007	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	1.2E-005	--	5.1E-004	5.2E-004
			Cobalt	--	--	--	--	Cobalt	heart	2.8E-004	--	1.2E-002	1.3E-002
			Copper	--	--	--	--	Copper	liver	1.7E-002	--	1.2E+000	1.2E+000
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	3.2E-004	--	1.4E-002	1.4E-002
			Diethylphthalate	--	--	--	--	Diethylphthalate	low body wt	4.1E-005	--	1.8E-003	1.8E-003
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	GI tract	1.3E-005	--	5.8E-004	5.9E-004
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	2.0E-003	--	9.0E-002	9.2E-002
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	3.3E-004	--	1.5E-002	1.5E-002
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	liver	3.4E-003	--	1.6E-001	1.7E-001
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	5.2E-005	--	2.3E-003	2.3E-003
			Fluorene	--	--	--	--	Fluorene	skeletal	2.3E-004	--	1.0E-002	1.0E-002
			Hexachlorobutadiene	3.1E-009	--	1.3E-007	1.4E-007	Hexachlorobutadiene	low body wt	2.4E-003	--	1.0E-001	1.1E-001
			Indeno(1,2,3-cd)pyrene	4.3E-008	--	1.9E-006	1.9E-006	Indeno(1,2,3-cd)pyrene	--	--	--	--	--

Table 6-2-15  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area2RME\_wk4\1.TT\_sum\_Ta2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Iron		--			Iron		3.2E-002	--	1.4E+000	1.5E+000
			Isophorone	7.2E-008	--	3.2E-006	3.3E-006	Isophorone	kidney	4.6E-003	--	2.0E-001	2.1E-001
			Lead		--			Lead	CNS	--	--		
			Manganese		--			Manganese	kidney	1.0E-002	--	4.5E-001	4.6E-001
			Mercury		--			Mercury	low body wt	--	--		
			Methylene Chloride	2.2E-008	--	1.7E-006	1.7E-006	Methylene Chloride	liver	5.7E-004	--	4.6E-002	4.7E-002
			m,p-xylene		--			m,p-xylene	fetotoxic	1.2E-006	--	6.1E-005	6.2E-005
			Naphthalene		--			Naphthalene	circulatory	1.2E-002	--	5.5E-001	5.6E-001
			Nickel		--			Nickel	low body wt	1.4E-003	--	1.2E+000	1.2E+000
			ortho-xylene		--			ortho-xylene	fetotoxic	6.3E-007	--	3.1E-005	3.2E-005
			Pentachlorophenol	3.2E-007	--	1.4E-005	1.4E-005	Pentachlorophenol	liver	1.1E-003	--	4.7E-002	4.8E-002
			Phenol		--			Phenol	liver	1.4E-004	--	6.3E-003	6.5E-003
			Pyrene		--			Pyrene	liver	1.4E-004	--	6.0E-003	6.1E-003
			Selenium		--			Selenium	liver	8.4E-004	--	3.7E-002	3.8E-002
			Silver		--			Silver	skin	3.5E-003	--	7.4E-001	7.5E-001
			Styrene		--			Styrene	liver	1.3E-004	--	5.8E-003	5.9E-003
			Tetrachloroethene	1.9E-006	--	8.5E-005	8.7E-005	Tetrachloroethene	liver	4.5E-002	--	2.0E+000	2.0E+000
			Thallium		--			Thallium		1.0E-002	--	4.6E-001	4.7E-001
			Toluene		--			Toluene	liver	3.3E-003	--	1.5E-001	1.5E-001
			Trichloroethene	1.6E-007	--	7.3E-008	7.5E-006	Trichloroethene	liver	3.0E-002	--	1.3E+000	1.4E+000
			Vanadium		--			Vanadium	circulatory	8.8E-004	--	3.9E-002	4.0E-002
			Vinyl Chloride	8.8E-009	--	3.9E-007	4.0E-007	Vinyl Chloride	liver	--	--		
			Xylenes (total)		--			Xylenes (total)	fetotoxic	9.1E-004	--	4.5E-002	4.6E-002
			Zinc		--			Zinc	thyroid	1.4E-002	--	2.1E+000	2.1E+000
			(total)	3.3E-004	--	1.5E-002	1.5E-002	(total)		1.7E+000	--	1.1E+003	1.1E+003
	AIR	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	1.1E-004	--	1.1E-004
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	2.4E-004	--	2.4E-004
			1,1,2-Trichloroethane	--	5.4E-010	--	5.4E-010	1,1,2-Trichloroethane	liver	--	--	--	
			1,1,2,2-Tetrachloroethane	--	1.2E-009	--	1.2E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	3.0E-003	--	3.0E-003
			1,2-Dichloroethane	--	4.8E-008	--	4.8E-008	1,2-Dichloroethane	circulatory	--	4.5E-003	--	4.5E-003
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	5.9E-003	--	5.9E-003
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	2.4E-005	--	2.4E-005
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	1.3E-010	--	1.3E-010
			1,4-Dichlorobenzene	--	1.2E-009	--	1.2E-009	1,4-Dichlorobenzene	liver	--	2.9E-006	--	2.9E-006
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.6E-008	--	1.6E-008
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	8.9E-002	--	8.9E-002
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.3E-003	--	1.3E-003
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	
			4,4'-DDT	--	2.3E-013	--	2.3E-013	4,4'-DDT	liver	--	--	--	
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	
			Acenaphthylene	--	--	--		Acenaphthylene		--	--	--	
			Acetone	--	--	--		Acetone		--	--	--	
			Aldrin	--	4.5E-011	--	4.5E-011	Aldrin		--	--	--	
			alpha-BHC	--	9.2E-013	--	9.2E-013	alpha-BHC		--	--	--	
			Anthracene	--	--	--		Anthracene		--	--	--	
			Antimony	--	--	--		Antimony		--	--	--	
			Aroclor-1242	--	2.5E-012	--	2.5E-012	Aroclor-1242		--	--	--	
			Aroclor-1248	--	4.5E-011	--	4.5E-011	Aroclor-1248		--	--	--	

Scenario Timeframe: Future  
 Receptor Population: Trespasser  
 Receptor Age: Adolescent

Table 6-2-15  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area2RME wk4 LTT sum Ta2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Aroclor-1254	--	3.4E-011	--	3.4E-011	Aroclor-1254		--	--	--	
			Aroclor-1260	--	3.1E-010	--	3.1E-010	Aroclor-1260		--	--	--	
			Arsenic	--	3.7E-011	--	3.7E-011	Arsenic	respiratory	--	--	--	
			Barium	--	--	--	--	Barium	fetotoxic	--	4.2E-005	--	4.2E-005
			Benzene	--	5.7E-008	--	5.7E-008	Benzene	blood disorders	--	1.4E-002	--	1.4E-002
			Benzoic Acid	--	--	--	--	Benzoic Acid		--	--	--	
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene		--	--	--	
			Benzo(a)pyrene	--	2.1E-012	--	2.1E-012	Benzo(a)pyrene		--	--	--	
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene		--	--	--	
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene		--	--	--	
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene		--	--	--	
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol		--	--	--	
			Beryllium	--	1.5E-012	--	1.5E-012	Beryllium	respiratory	--	3.7E-007	--	3.7E-007
			beta-BHC	--	5.0E-013	--	5.0E-013	beta-BHC		--	--	--	
			bis(2-Chloroethyl) ether	--	4.6E-007	--	4.6E-007	bis(2-Chloroethyl) ether	liver	--	--	--	
			bis(2-Ethylhexyl)phthalate	--	2.6E-012	--	2.6E-012	bis(2-Ethylhexyl)phthalate		--	--	--	
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate		--	--	--	
			Cadmium	--	3.4E-010	--	3.4E-010	Cadmium		--	--	--	
			Carbon Disulfide	--	--	--	--	Carbon Disulfide		--	3.5E-011	--	3.5E-011
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	1.0E-003	--	1.0E-003
			Chloroform	--	1.6E-007	--	1.6E-007	Chloroform	liver	--	2.8E-001	--	2.8E-001
			Chromium 3+	--	--	--	--	Chromium 3+		--	--	--	
			Chromium 6+	--	4.0E-009	--	4.0E-009	Chromium 6+	respiratory	--	--	--	
			Chrysene	--	--	--	--	Chrysene		--	--	--	
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene		--	--	--	
			Cobalt	--	--	--	--	Cobalt		--	--	--	
			Copper	--	--	--	--	Copper		--	--	--	
			Cyanide (total)	--	--	--	--	Cyanide (total)		--	--	--	
			Dibenzofuran	--	--	--	--	Dibenzofuran		--	--	--	
			Dibenzo(a,h)anthracene	--	--	--	--	Dibenzo(a,h)anthracene		--	--	--	
			Dieldrin	--	9.3E-014	--	9.3E-014	Dieldrin		--	--	--	
			Diethylphthalate	--	--	--	--	Diethylphthalate		--	--	--	
			Dimethylphthalate	--	--	--	--	Dimethylphthalate		--	--	--	
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate		--	--	--	
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate		--	--	--	
			Endosulfan I	--	--	--	--	Endosulfan I		--	--	--	
			Endrin	--	--	--	--	Endrin		--	--	--	
			Endrin ketone	--	--	--	--	Endrin ketone		--	--	--	
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	3.4E-004	--	3.4E-004
			Fluoranthene	--	--	--	--	Fluoranthene		--	--	--	
			Fluorene	--	--	--	--	Fluorene		--	--	--	
			gamma-Chlordane	--	1.0E-014	--	1.0E-014	gamma-Chlordane		--	1.7E-009	--	1.7E-009
			Heptachlor	--	1.6E-015	--	1.6E-015	Heptachlor		--	--	--	
			Heptachlor epoxide	--	1.5E-015	--	1.5E-015	Heptachlor epoxide		--	--	--	
			Hexachlorobenzene	--	2.8E-016	--	2.8E-016	Hexachlorobenzene	liver	--	--	--	
			Hexachlorobutadiene	--	4.8E-013	--	4.8E-013	Hexachlorobutadiene	kidney	--	--	--	
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	
			Isophorone	--	--	--	--	Isophorone		--	--	--	
			Lead	--	--	--	--	Lead		--	--	--	
			Manganese	--	--	--	--	Manganese	respiratory	--	1.2E-004	--	1.2E-004
			Mercury	--	--	--	--	Mercury	CNS	--	5.2E-007	--	5.2E-007
			Methylene Chloride	--	1.5E-008	--	1.5E-008	Methylene Chloride	respiratory	--	1.3E-004	--	1.3E-004
			m,p-xylene	--	--	--	--	m,p-xylene		--	--	--	
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	1.5E-002	--	1.5E-002
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine		--	--	--	
			ortho-xylene	--	--	--	--	ortho-xylene		--	--	--	
			Pentachlorophenol	--	--	--	--	Pentachlorophenol		--	--	--	
			Phenanthrene	--	--	--	--	Phenanthrene		--	--	--	
			Phenol	--	--	--	--	Phenol		--	--	--	

Table 6-2-15  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area2RME.w441.TT\_sum\_Ta2RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Phthalic anhydride	--		--		Phthalic anhydride		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	2.3E-005	--	2.3E-005
			Tetrachloroethene	--	3.5E-008	--	3.5E-008	Tetrachloroethene	liver	--	1.5E-003	--	1.5E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	8.9E-003	--	8.9E-003
			Trichloroethene	--	6.1E-008	--	6.1E-008	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	1.9E-008	--	1.9E-008	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		8.6E-007		8.6E-007	(total)			4.2E-001		4.2E-001
				Total Risk Across Surface Soil								Total Hazard Index Across Subsurface Soil	
				1.5E-002								1.1E+003	
Total Risk Across All Media and All Exposure Routes				Reserved									

Total Kidney HI:	9.6E+001
Total Skin HI:	9.2E+002
Total Thyroid HI:	2.1E+000
Total Liver HI:	6.6E+001
Total Circulatory System HI:	1.8E+000
Total CNS HI:	2.6E-001
Total Fetotoxic HI:	4.6E-001
Total GI Tract HI:	6.0E-001
Total Respiratory HI:	1.3E+000
Total Eyes HI:	5.7E-003
Total Reproductive HI:	0.0E+000
Total Mammary HI:	4.8E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.3E-002
Total Skeletal System HI:	1.0E-002
Total Thyroid HI:	2.1E+000
Total Blood Disorders HI:	8.2E-001



Table 6-2-16  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age Adolescent

File Area2CT.wk4 11T sum\_Ta2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	circulatory	1.7E-005	--	2.5E-004	2.6E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	4.3E-004	--	6.2E-003	6.6E-003
			1,1,2,2-Tetrachloroethane	6.8E-012	--	1.4E-010	1.5E-010	1,1,2,2-Tetrachloroethane	liver	7.9E-008	--	1.6E-006	1.7E-006
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	CNS	3.1E-004	--	4.4E-003	4.7E-003
			1,2-Dichloroethane	1.5E-009	--	2.2E-008	2.4E-008	1,2-Dichloroethane	fetotoxic	7.9E-005	--	1.1E-003	1.2E-003
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	kidney	5.0E-004	--	7.2E-003	7.7E-003
			1,2-Dichloropropane	1.7E-010	--	2.5E-009	2.7E-009	1,2-Dichloropropane	GI tract	--	--	--	--
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	low body wt	1.3E-004	--	1.9E-003	2.0E-003
			1,4-Dichlorobenzene	2.1E-011	--	3.0E-010	3.2E-010	1,4-Dichlorobenzene	GI tract	4.0E-006	--	5.7E-005	6.1E-005
			2-Butanone	--	--	--	--	2-Butanone	liver	9.9E-004	--	1.5E-002	1.6E-002
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	3.0E-004	--	4.3E-003	4.6E-003
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	GI tract	3.4E-003	--	4.9E-002	5.3E-002
			2-Methylphenol	--	--	--	--	2-Methylphenol	liver	3.2E-004	--	4.5E-003	4.9E-003
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	generalized	5.8E-004	--	8.3E-003	8.9E-003
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	liver	5.9E-004	--	8.5E-003	9.1E-003
			4-Methylphenol	--	--	--	--	4-Methylphenol	respiratory	4.7E-003	--	1.0E-001	1.1E-001
			4,4'-DDD	7.4E-010	--	1.1E-008	1.1E-008	4,4'-DDD	liver	--	--	--	--
			4,4'-DDE	2.8E-010	--	4.0E-009	4.3E-009	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	5.4E-010	--	7.8E-009	8.4E-009	4,4'-DDT	fetotoxic	4.5E-004	--	6.4E-003	6.9E-003
			Acenaphthene	--	--	--	--	Acenaphthene	eyes	3.3E-005	--	4.7E-004	5.1E-004
			Acetone	--	--	--	--	Acetone	fetotoxic	1.6E-003	--	2.9E-002	3.1E-002
			Aldrin	1.2E-007	--	1.8E-006	1.9E-006	Aldrin	liver	3.4E-002	--	4.9E-001	5.2E-001
			alpha-BHC	2.0E-009	--	2.8E-008	3.0E-008	alpha-BHC	liver	--	--	--	--
			Aluminum	--	--	--	--	Aluminum	circulatory	1.1E-003	--	1.6E-002	1.7E-002
			Anthracene	--	--	--	--	Anthracene	GI tract	5.7E-007	--	8.2E-006	8.8E-006
			Antimony	--	--	--	--	Antimony	skin	5.4E-002	--	7.8E+001	7.8E+001
			Aroclor-1248	--	--	--	--	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	6.8E-008	--	1.1E-006	1.2E-006	Aroclor-1254	liver	2.4E-001	--	3.8E+000	4.1E+000
			Aroclor-1260	6.4E-006	--	9.2E-005	9.8E-005	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	1.1E-008	--	1.7E-007	1.8E-007	Arsenic	circulatory	3.4E-003	--	5.2E-002	5.5E-002
			Barium	--	--	--	--	Barium	--	5.1E-003	--	7.3E-002	7.8E-002
			Benzene	2.6E-009	--	4.2E-008	4.4E-008	Benzene	blood disorders	4.2E-003	--	6.7E-002	7.2E-002
			Benzoic Acid	--	--	--	--	Benzoic Acid	GI tract	7.9E-006	--	1.1E-004	1.2E-004
			Benzo(a)anthracene	1.9E-009	--	2.7E-008	2.9E-008	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	1.0E-008	--	1.7E-007	1.8E-007	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	3.6E-009	--	5.2E-008	5.6E-008	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	3.6E-010	--	5.2E-009	5.6E-009	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	CNS	1.5E-005	--	2.1E-004	2.3E-004
			Beryllium	--	--	--	--	Beryllium	kidney	2.2E-005	--	3.2E-002	3.2E-002
			beta-BHC	1.4E-009	--	1.9E-008	2.1E-008	beta-BHC	liver	--	--	--	--
			bis(2-Chloroethyl) ether	1.1E-007	--	1.6E-006	1.8E-006	bis(2-Chloroethyl) ether	reproductive	--	--	--	--
			bis(2-Ethylhexyl)phthalate	3.0E-008	--	4.4E-007	4.7E-007	bis(2-Ethylhexyl)phthalate	liver	1.5E-002	--	2.2E-001	2.3E-001
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	2.8E-004	--	4.0E-003	4.3E-003
			Cadmium	--	--	--	--	Cadmium	kidney	1.4E-002	--	8.0E+000	8.0E+000
			Chloroform	8.0E-010	--	1.2E-008	1.3E-008	Chloroform	circulatory	1.8E-003	--	2.8E-002	3.0E-002
			Chromium 3+	--	--	--	--	Chromium 3+	liver	1.3E-004	--	4.7E-001	4.7E-001
			Chrysene	2.6E-011	--	9.2E-010	9.4E-010	Chrysene	liver	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	circulatory	3.0E-006	--	4.4E-005	4.7E-005
			Cobalt	--	--	--	--	Cobalt	heart	7.2E-005	--	1.0E-003	1.1E-003
			Copper	--	--	--	--	Copper	liver	4.3E-003	--	1.0E-001	1.1E-001
			Dibenzofuran	--	--	--	--	Dibenzofuran	dec growth rate	8.2E-005	--	1.2E-003	1.3E-003

Table 6-2-16  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area2CT.wk4\TT\_sum\_Ta2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate		--			Diethylphthalate	low body wt	1.1E-005	--	1.5E-004	1.6E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	3.4E-006	--	4.9E-005	5.3E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	5.1E-004	--	7.6E-003	8.1E-003
			Di-n-octylphthalate		--			Di-n-octylphthalate		8.5E-005	--	1.2E-003	1.3E-003
			Ethyl Benzene		--			Ethyl Benzene	liver	8.9E-004	--	1.4E-002	1.5E-002
			Fluoranthene		--			Fluoranthene	kidney	1.3E-005	--	1.9E-004	2.1E-004
			Fluorene		--			Fluorene	skeletal	5.9E-005	--	8.5E-004	9.1E-004
			Hexachlorobutadiene	6.8E-011	--	9.8E-010	1.0E-009	Hexachlorobutadiene	low body wt	6.1E-004	--	8.8E-003	9.4E-003
			Indeno(1,2,3-cd)pyrene	9.6E-010	--	1.4E-008	1.5E-008	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		8.4E-003	--	1.2E-001	1.3E-001
			Isophorone	1.6E-009	--	2.3E-008	2.5E-008	Isophorone	kidney	1.2E-003	--	1.7E-002	1.8E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	2.6E-003	--	3.8E-002	4.1E-002
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	4.8E-010	--	1.3E-008	1.3E-008	Methylene Chloride	liver	1.5E-004	--	3.9E-003	4.1E-003
			m,p-xylene		--			m,p-xylene	fetotoxic	3.2E-007	--	5.2E-006	5.5E-006
			Naphthalene		--			Naphthalene	circulatory	3.2E-003	--	4.6E-002	5.0E-002
			Nickel		--			Nickel	low body wt	3.6E-004	--	1.0E-001	1.0E-001
			ortho-xylene		--			ortho-xylene	fetotoxic	1.6E-007	--	2.6E-006	2.8E-006
			Pentachlorophenol	7.1E-009	--	1.0E-007	1.1E-007	Pentachlorophenol	liver	2.8E-004	--	4.0E-003	4.3E-003
			Phenol		--			Phenol	liver	3.7E-005	--	5.4E-004	5.7E-004
			Pyrene		--			Pyrene	liver	3.5E-005	--	5.0E-004	5.4E-004
			Selenium		--			Selenium	liver	2.2E-004	--	3.2E-003	3.4E-003
			Silver		--			Silver	skin	9.2E-004	--	6.3E-002	6.4E-002
			Styrene		--			Styrene	liver	3.4E-005	--	4.9E-004	5.3E-004
			Tetrachloroethene	4.3E-008	--	6.2E-007	6.6E-007	Tetrachloroethene	liver	1.2E-002	--	1.7E-001	1.8E-001
			Thallium		--			Thallium		2.7E-003	--	3.9E-002	4.2E-002
			Toluene		--			Toluene	liver	8.5E-004	--	1.2E-002	1.3E-002
			Trichloroethene	3.6E-009	--	5.3E-008	5.7E-008	Trichloroethene	liver	7.7E-003	--	1.1E-001	1.2E-001
			Vanadium		--			Vanadium	circulatory	2.3E-004	--	3.3E-003	3.5E-003
			Vinyl Chloride	2.0E-010	--	2.8E-009	3.0E-009	Vinyl Chloride	liver		--		
			Xylenes (total)		--			Xylenes (total)	fetotoxic	2.4E-004	--	3.8E-003	4.0E-003
			Zinc		--			Zinc	thyroid	3.6E-003	--	1.7E-001	1.8E-001
			(total)	7.4E-006		1.1E-004	1.1E-004	(total)		4.4E-001		9.2E+001	9.3E+001
	AIR	Area 2, Soil (2' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	2.8E-005	--	2.8E-005
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	6.3E-005	--	6.3E-005
			1,1,2-Trichloroethane	--	1.2E-011	--	1.2E-011	1,1,2-Trichloroethane	liver	--	--	--	
			1,1,2,2-Tetrachloroethane	--	2.6E-011	--	2.6E-011	1,1,2,2-Tetrachloroethane	liver	--	--	--	
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	7.7E-004	--	7.7E-004
			1,2-Dichloroethane	--	1.1E-009	--	1.1E-009	1,2-Dichloroethane	circulatory	--	1.2E-003	--	1.2E-003
			1,2-Dichloroethane (total)	--	--	--		1,2-Dichloroethane (total)		--	--	--	
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	1.5E-003	--	1.5E-003
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	6.2E-006	--	6.2E-006
			1,3-Dichlorobenzene	--	--	--		1,3-Dichlorobenzene	respiratory	--	3.3E-011	--	3.3E-011
			1,4-Dichlorobenzene	--	2.7E-011	--	2.7E-011	1,4-Dichlorobenzene	liver	--	7.5E-007	--	7.5E-007
			2-Butanone	--	--	--		2-Butanone	CNS	--	4.1E-009	--	4.1E-009
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	2.3E-002	--	2.3E-002
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	
			2,4-Dichlorophenol	--	--	--		2,4-Dichlorophenol		--	--	--	
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	

Table 6-2-16  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area2CT.wk4\TT\_sum\_Ta2CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	3.4E-004	--	3.4E-004
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	
			4,4'-DDT	--	5.0E-015	--	5.0E-015	4,4'-DDT	liver	--	--	--	
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	
			Acenaphthylene	--	--	--		Acenaphthylene		--	--	--	
			Acetone	--	--	--		Acetone		--	--	--	
			Aldrin	--	1.0E-012	--	1.0E-012	Aldrin		--	--	--	
			alpha-BHC	--	2.0E-014	--	2.0E-014	alpha-BHC		--	--	--	
			Anthracene	--	--	--		Anthracene		--	--	--	
			Antimony	--	--	--		Antimony		--	--	--	
			Aroclor-1242	--	5.6E-014	--	5.6E-014	Aroclor-1242		--	--	--	
			Aroclor-1248	--	1.0E-012	--	1.0E-012	Aroclor-1248		--	--	--	
			Aroclor-1254	--	7.5E-013	--	7.5E-013	Aroclor-1254		--	--	--	
			Aroclor-1260	--	6.8E-012	--	6.8E-012	Aroclor-1260		--	--	--	
			Arsenic	--	8.2E-013	--	8.2E-013	Arsenic	respiratory	--	--	--	
			Barium	--	--	--		Barium	fetotoxic	--	1.1E-005	--	1.1E-005
			Benzene	--	1.3E-009	--	1.3E-009	Benzene	blood disorders	--	3.6E-003	--	3.6E-003
			Benzoic Acid	--	--	--		Benzoic Acid		--	--	--	
			Benzo(a)anthracene	--	--	--		Benzo(a)anthracene		--	--	--	
			Benzo(a)pyrene	--	4.7E-014	--	4.7E-014	Benzo(a)pyrene		--	--	--	
			Benzo(b)fluoranthene	--	--	--		Benzo(b)fluoranthene		--	--	--	
			Benzo(g,h,i)perylene	--	--	--		Benzo(g,h,i)perylene		--	--	--	
			Benzo(k)fluoranthene	--	--	--		Benzo(k)fluoranthene		--	--	--	
			Benzyl Alcohol	--	--	--		Benzyl Alcohol		--	--	--	
			Beryllium	--	3.3E-014	--	3.3E-014	Beryllium	respiratory	--	9.5E-008	--	9.5E-008
			beta-BHC	--	1.1E-014	--	1.1E-014	beta-BHC		--	--	--	
			bis(2-Chloroethyl) ether	--	1.0E-008	--	1.0E-008	bis(2-Chloroethyl) ether	liver	--	--	--	
			bis(2-Ethylhexyl)phthalate	--	5.8E-014	--	5.8E-014	bis(2-Ethylhexyl)phthalate		--	--	--	
			Butylbenzylphthalate	--	--	--		Butylbenzylphthalate		--	--	--	
			Cadmium	--	7.6E-012	--	7.6E-012	Cadmium		--	--	--	
			Carbon Disulfide	--	--	--		Carbon Disulfide		--	9.1E-012	--	9.1E-012
			Chlorobenzene	--	--	--		Chlorobenzene	liver	--	2.6E-004	--	2.6E-004
			Chloroform	--	3.6E-009	--	3.6E-009	Chloroform	liver	--	7.2E-002	--	7.2E-002
			Chromium 3+	--	--	--		Chromium 3+		--	--	--	
			Chromium 6+	--	8.9E-011	--	8.9E-011	Chromium 6+	respiratory	--	--	--	
			Chrysene	--	--	--		Chrysene		--	--	--	
			cis-1,2-Dichloroethene	--	--	--		cis-1,2-Dichloroethene		--	--	--	
			Cobalt	--	--	--		Cobalt		--	--	--	
			Copper	--	--	--		Copper		--	--	--	
			Cyanide (total)	--	--	--		Cyanide (total)		--	--	--	
			Dibenzofuran	--	--	--		Dibenzofuran		--	--	--	
			Dibenzo(a,h)anthracene	--	--	--		Dibenzo(a,h)anthracene		--	--	--	
			Dieldrin	--	2.1E-015	--	2.1E-015	Dieldrin		--	--	--	
			Diethylphthalate	--	--	--		Diethylphthalate		--	--	--	
			Dimethylphthalate	--	--	--		Dimethylphthalate		--	--	--	
			Di-n-butylphthalate	--	--	--		Di-n-butylphthalate		--	--	--	

Table 6-2-16  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

Ffe\_Area2CJ.wk4\TT sum Ta2CJ

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	8.9E-005	--	8.9E-005
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			gamma-Chlordane	--	2.3E-016	--	2.3E-016	gamma-Chlordane		--	4.5E-010	--	4.5E-010
			Heptachlor	--	3.6E-017	--	3.6E-017	Heptachlor		--		--	
			Heptachlor epoxide	--	3.4E-017	--	3.4E-017	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	6.2E-018	--	6.2E-018	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.1E-014	--	1.1E-014	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	3.0E-005	--	3.0E-005
			Mercury	--		--		Mercury	CNS	--	1.4E-007	--	1.4E-007
			Methylene Chloride	--	3.3E-010	--	3.3E-010	Methylene Chloride	respiratory	--	3.3E-005	--	3.3E-005
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	4.0E-003	--	4.0E-003
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Phthalic anhydride	--		--		Phthalic anhydride		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	5.9E-006	--	5.9E-006
			Tetrachloroethene	--	7.9E-010	--	7.9E-010	Tetrachloroethene	liver	--	3.9E-004	--	3.9E-004
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	2.3E-003	--	2.3E-003
			Trichloroethene	--	1.3E-009	--	1.3E-009	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	4.3E-010	--	4.3E-010	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		1.9E-008		1.9E-008	(total)			1.1E-001		1.1E-001
Total Risk Across Surface Soil							1.1E-004	Total Hazard Index Across Subsurface Soil					9.3E+001
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	8.1E+000
Total Skin HI:	7.8E+001
Total Thyroid HI:	1.8E-001
Total Liver HI:	5.9E+000
Total Circulatory System HI:	1.6E-001
Total CNS HI:	4.0E-002
Total Fetotoxic HI:	4.3E-002
Total GI Tract HI:	5.3E-002
Total Respiratory HI:	1.1E-001

Scenario Timeframe Future  
Receptor Population Trespasser  
Receptor Age: Adolescent

File: Area2CT.wk4\TT\_sum Ta2CT

[illegible]

Table 6-2-17  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS2RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Ditch Area 2	2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	7.7E-006		6.8E-005	7.6E-005
			2-Methylnaphthalene					2-Methylnaphthalene	GI Tract	2.0E-006		1.8E-005	2.0E-005
			Aluminum					Aluminum	circulatory system	1.2E-003		1.1E-003	2.3E-003
			Anthracene					Anthracene	GI Tract	7.0E-008		6.2E-007	6.9E-007
			Arsenic	3.2E-007		8.9E-007	1.2E-006	Arsenic	circulatory system	8.5E-003		2.3E-002	3.2E-002
			Barium					Barium	NA	3.3E-004		2.9E-004	6.2E-004
			Benzene	8.6E-009		8.4E-008	9.2E-008	Benzene	blood disorders	1.2E-003		1.2E-002	1.3E-002
			Benzo(a)anthracene	1.1E-008		9.6E-008	1.1E-007	Benzo(a)anthracene	NA				
			Benzo(a)pyrene	1.1E-007		1.4E-006	1.5E-006	Benzo(a)pyrene	NA				
			Benzo(b)fluoranthene	9.3E-009		8.1E-008	9.1E-008	Benzo(b)fluoranthene	NA				
			Benzo(k)fluoranthene	1.1E-009		9.4E-009	1.0E-008	Benzo(k)fluoranthene	NA				
			Beryllium					Beryllium	kidney	6.0E-005		5.2E-003	5.3E-003
			bis(2-Chloroethyl) ether	1.3E-008		1.1E-007	1.3E-007	bis(2-Chloroethyl) ether	reproductive system				
			bis(2-Ethylhexyl)phthalate	1.3E-009		1.1E-008	1.3E-008	bis(2-Ethylhexyl)phthalate	liver	5.6E-005		4.9E-004	5.5E-004
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	2.2E-007		1.9E-006	2.1E-006
			Cadmium					Cadmium	kidney	1.2E-003		2.1E-001	2.1E-001
			Chloroform	3.9E-013		3.5E-010	3.5E-010	Chloroform	circulatory system	7.6E-008		7.0E-007	7.7E-007
			Chromium (total)					Chromium (total)		2.4E-003		2.1E-002	2.4E-002
			Chrysene	1.1E-010		2.3E-009	2.4E-009	Chrysene	liver				
			Copper					Copper	liver	2.4E-004		3.5E-004	5.8E-004
			Dibenzo(a,h)anthracene	2.5E-008		2.4E-007	2.7E-007	Dibenzo(a,h)anthracene					
			Ethyl Benzene					Ethyl Benzene	liver	3.3E-007		3.2E-006	3.5E-006
			Fluoranthene					Fluoranthene	kidney	6.3E-006		5.6E-005	6.2E-005
			Indeno(1,2,3-cd)pyrene	5.9E-009		5.2E-008	5.7E-008	Indeno(1,2,3-cd)pyrene	NA				
			Iron					Iron		1.2E-002		1.0E-002	2.2E-002
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	4.6E-003		4.1E-003	8.7E-003
			Mercury					Mercury	low body weight				
			Naphthalene					Naphthalene	circulatory system	1.4E-006		1.2E-005	1.4E-005
			Nickel					Nickel	low body weight	1.8E-004		3.2E-003	3.4E-003
			Pyrene					Pyrene	liver	9.3E-006		8.2E-005	9.1E-005
			Toluene					Toluene	liver	7.1E-008		6.2E-007	7.0E-007
			Vanadium					Vanadium	circulatory system	5.2E-004		4.6E-004	9.8E-004
			Xylenes (total)					Xylenes (total)	fetotoxic	2.5E-008		2.5E-007	2.7E-007
			Zinc					Zinc	thyroid	9.8E-005		2.9E-004	3.9E-004
(Total)				5.0E-007		3.0E-006	3.5E-006	(Total)		3.2E-002		2.9E-001	3.2E-001
				Total Risk Across Sediments								Total Hazard Index Across All Exposure Routes	
												3.2E-001	

Total Circulatory System HI =	3.5E-002
Total Low Body Weight HI =	3.4E-003
Total Mammary HI =	2.1E-006
Total Fetotoxic HI =	2.7E-007
Total GI Tract HI =	2.1E-005
Total Thyroid HI =	3.9E-004
Total Kidney HI =	2.2E-001
Total Liver HI =	1.2E-003
Total Blood Disorders HI =	1.3E-002

Table 6-2-18  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS2CT WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Sediment	Sediment	Ditch Area 2	2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	2.0E-006		5.8E-006	7.8E-006		
			2-Methylnaphthalene					2-Methylnaphthalene	GI Tract	5.2E-007		1.5E-006	2.0E-006		
			Aluminum					Aluminum	circulatory system	3.2E-004		9.2E-005	4.1E-004		
			Anthracene					Anthracene	GI Tract	1.8E-008		5.2E-008	7.0E-008		
			Arsenic	7.1E-009		6.5E-009	1.4E-008	Arsenic	circulatory system	2.2E-003		2.0E-003	4.2E-003		
			Barium					Barium	NA	8.5E-005		2.5E-005	1.1E-004		
			Benzene	1.9E-010		6.1E-010	8.0E-010	Benzene	blood disorders	3.1E-004		9.8E-004	1.3E-003		
			Benzo(a)anthracene	2.4E-010		7.0E-010	9.4E-010	Benzo(a)anthracene	NA						
			Benzo(a)pyrene	2.4E-009		1.0E-008	1.3E-008	Benzo(a)pyrene	NA						
			Benzo(b)fluoranthene	2.1E-010		5.9E-010	8.0E-010	Benzo(b)fluoranthene	NA						
			Benzo(k)fluoranthene	2.4E-011		6.8E-011	9.2E-011	Benzo(k)fluoranthene	NA						
			Beryllium					Beryllium	kidney	1.5E-005		4.4E-004	4.6E-004		
			bis(2-Chloroethyl) ether	2.9E-010		8.3E-010	1.1E-009	bis(2-Chloroethyl) ether	reproductive system						
			bis(2-Ethylhexyl)phthalate	2.9E-011		8.3E-011	1.1E-010	bis(2-Ethylhexyl)phthalate	liver	1.4E-005		4.2E-005	5.6E-005		
			Butylbenzylphthalate					Butylbenzylphthalate	mammary	5.6E-008		1.6E-007	2.2E-007		
			Cadmium					Cadmium	kidney	3.0E-004		1.7E-002	1.8E-002		
			Chloroform	8.6E-015		2.6E-012	2.6E-012	Chloroform	circulatory system	2.0E-008		5.9E-008	7.9E-008		
			Chromium (total)					Chromium (total)		6.2E-004		1.8E-003	2.4E-003		
			Chrysene	2.4E-012		1.7E-011	1.9E-011	Chrysene	liver						
			Copper					Copper	liver	6.1E-005		2.9E-005	9.0E-005		
			Dibenzo(a,h)anthracene	5.5E-010		1.8E-009	2.3E-009	Dibenzo(a,h)anthracene							
			Ethyl Benzene					Ethyl Benzene	liver	8.5E-008		2.7E-007	3.5E-007		
			Fluoranthene					Fluoranthene	kidney	1.6E-006		4.7E-006	6.4E-006		
			Indeno(1,2,3-cd)pyrene	1.3E-010		3.8E-010	5.1E-010	Indeno(1,2,3-cd)pyrene	NA						
			Iron					Iron		3.0E-003		8.8E-004	3.9E-003		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	1.2E-003		3.5E-004	1.5E-003		
			Mercury					Mercury	low body weight						
			Naphthalene					Naphthalene	circulatory system	3.6E-007		1.0E-006	1.4E-006		
			Nickel					Nickel	low body weight	4.7E-005		2.7E-004	3.2E-004		
			Pyrene					Pyrene	liver	2.4E-006		6.9E-006	9.3E-006		
			Toluene					Toluene	liver	1.8E-008		5.3E-008	7.1E-008		
			Vanadium					Vanadium	circulatory system	1.3E-004		3.9E-005	1.7E-004		
			Xylenes (total)					Xylenes (total)	fetotoxic	6.6E-009		2.1E-008	2.8E-008		
			Zinc					Zinc	thyroid	2.5E-005		2.4E-005	5.0E-005		
(Total)				1.1E-008		2.2E-008	3.3E-008	(Total)		8.4E-003		2.4E-002	3.3E-002		
Total Risk Across Sediments							3.3E-008	Total Hazard Index Across All Exposure Routes							3.3E-002

Total Circulatory System HI =	4.8E-003
Total Low Body Weight HI =	3.2E-004
Total Mammary HI =	2.2E-007
Total Fetotoxic HI =	2.8E-008
Total GI Tract HI =	2.1E-006
Total Thyroid HI =	5.0E-005
Total Kidney HI =	2.0E-002
Total Liver HI =	1.6E-004
Total Blood Disorders HI =	1.3E-003

Table 6-2-19  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: FTRES2.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure			
Surface Water	Surface Water	Ditch Area 2	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	1.3E-006		1.4E-006	2.7E-006			
			1,2-Dichloroethene(total)					1,2-Dichloroethene(total)	kidney	4.4E-005		5.2E-005	9.5E-005			
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	7.9E-005		1.6E-004	2.3E-004			
			2-Butanone (MEK)					2-Butanone (MEK)	liver	3.1E-005		3.9E-006	3.5E-005			
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver	1.3E-005		1.6E-005	2.9E-005			
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	8.1E-005		3.9E-005	1.2E-004			
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory	2.4E-004		4.5E-004	6.8E-004			
			Acetone					Acetone	fetotoxic	5.0E-004		3.8E-005	5.4E-004			
			Aluminum					Aluminum	circulatory system	6.2E-005		5.4E-006	6.7E-005			
			Ammonia					Ammonia	kidney							
			Arsenic	7.4E-007		6.9E-008	8.1E-007	Arsenic	circulatory system	2.0E-002		1.8E-003	2.2E-002			
			Barium					Barium	NA	6.2E-004		5.5E-005	6.7E-004			
			Benzene	1.5E-007		3.8E-007	5.2E-007	Benzene	blood disorders	2.0E-002		5.2E-002	7.2E-002			
			Beryllium					Beryllium	kidney	1.8E-005		1.6E-004	1.8E-004			
			bis(2-Chloroethyl)Ether	9.3E-007		2.8E-007	1.2E-006	bis(2-Chloroethyl)Ether	reproductive							
			Chloroethane	9.5E-010		8.2E-010	1.8E-009	Chloroethane	liver	9.9E-006		8.5E-006	1.8E-005			
			Chromium					Chromium		1.2E-003		1.1E-003	2.3E-003			
			Ethylbenzene					Ethylbenzene	liver	7.9E-006		7.6E-005	8.4E-005			
			Iron					Iron		6.3E-003		5.5E-004	6.8E-003			
			Isophorone	5.2E-011		3.1E-011	8.3E-011	Isophorone	kidney	3.3E-006		2.0E-006	5.2E-006			
			Lead					Lead	CNS							
			Manganese					Manganese	kidney	6.5E-003		5.7E-004	7.1E-003			
			Nickel					Nickel	low body wt	5.3E-004		9.3E-005	6.2E-004			
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	1.6E-004			1.6E-004			
			Phenol					Phenol	liver	5.0E-006		3.2E-006	8.3E-006			
			Toluene					Toluene	liver	4.6E-006		2.4E-005	2.8E-005			
			Xylene (total)					Xylene (total)	fetotoxic	2.3E-006		2.1E-005	2.4E-005			
			Zinc					Zinc	thyroid	2.3E-005		4.1E-006	2.7E-005			
			(Total)				1.8E-006		7.3E-007	2.6E-006	(Total)		5.7E-002		5.8E-002	1.1E-001
			Total Risk Across Surface Water				2.6E-006				Total Hazard Index Across All Exposure Routes				1.1E-001	

Total Circulatory System HI =	2.2E-002
Total Fetus HI =	7.2E-004
Total Liver HI =	3.2E-004
Total Kidney HI =	7.4E-003
Total Blood Disorders HI =	7.2E-002



Table 6-2-20  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: FTRES2CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Water	Surface Water	Ditch Area 2	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	3.3E-007		3.6E-007	6.9E-007
			1,2-Dichloroethene(total)					1,2-Dichloroethene(total)	kidney	1.1E-005		1.3E-005	2.4E-005
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	2.0E-005		4.1E-005	6.1E-005
			2-Butanone (MEK)					2-Butanone (MEK)	liver	7.7E-006		9.4E-007	8.6E-006
			2-Methylphenol (O-Cresol)					2-Methylphenol (O-Cresol)	liver	3.3E-006		4.3E-006	7.5E-006
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	2.0E-005		1.0E-005	3.0E-005
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory	5.9E-005		1.2E-004	1.8E-004
			Acetone					Acetone	fetotoxic	1.2E-004		9.1E-006	1.3E-004
			Aluminum					Aluminum	circulatory system	1.5E-005		1.1E-006	1.7E-005
			Ammonia					Ammonia	kidney				
			Arsenic	1.6E-008		1.2E-009	1.7E-008	Arsenic	circulatory system	4.9E-003		3.7E-004	5.3E-003
			Barium					Barium	NA	1.5E-004		1.1E-005	1.7E-004
			Benzene	3.1E-009		8.0E-009	1.1E-008	Benzene	blood disorders	5.0E-003		1.3E-002	1.8E-002
			Beryllium					Beryllium	kidney	4.6E-006		3.3E-005	3.8E-005
			bis(2-Chloroethyl)Ether	2.0E-008		6.7E-009	2.7E-008	bis(2-Chloroethyl)Ether	reproductive				
			Chloroethane	2.0E-011		1.7E-011	3.7E-011	Chloroethane	liver	2.5E-006		2.0E-006	4.5E-006
			Chromium					Chromium		3.1E-004		2.2E-004	5.3E-004
			Ethylbenzene					Ethylbenzene	liver	2.0E-006		2.0E-005	2.2E-005
			Iron					Iron		1.6E-003		1.1E-004	1.7E-003
			Isophorone	1.1E-012		7.3E-013	1.8E-012	Isophorone	kidney	8.2E-007		5.4E-007	1.4E-006
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	1.6E-003		1.2E-004	1.7E-003
			Nickel					Nickel	low body wt	1.3E-004		1.9E-005	1.5E-004
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	3.9E-005			3.9E-005
			Phenol					Phenol	liver	1.3E-006		8.3E-007	2.1E-006
			Toluene					Toluene	liver	1.1E-006		6.2E-006	7.3E-006
			Xylene (total)					Xylene (total)	fetotoxic	5.7E-007		5.5E-006	6.1E-006
			Zinc					Zinc	thyroid	5.8E-006		8.3E-007	6.6E-006
(Total)				3.9E-008		1.6E-008	5.5E-008	(Total)		1.4E-002		1.4E-002	2.8E-002
Total Risk Across Surface Water				5.5E-008				Total Hazard Index Across All Exposure Routes				2.8E-002	

Total Circulatory System HI = 5.3E-003  
Total Fetus HI = 1.8E-004  
Total Liver HI = 8.2E-005  
Total Kidney HI = 1.8E-003  
Total Blood Disorders HI = 1.8E-002

Table 6-3-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area3RME wk41 TT sum\_RMW3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	1.9E-005	--	9.6E-004	9.8E-004
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	4.3E-001	--	2.2E+001	2.2E+001
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	7.4E-006	--	3.7E-004	3.8E-004
			1,2-Dichloroethane	3.0E-008	--	1.5E-006	1.5E-006	1,2-Dichloroethane	fetotoxic	3.0E-005	--	1.5E-003	1.6E-003
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	3.3E-003	--	1.6E-001	1.7E-001
			1,2-Dichloropropane	1.5E-008	--	7.8E-007	7.7E-007	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	9.0E-010	--	4.5E-008	4.6E-008	1,4-Dichlorobenzene	GI tract	3.5E-006	--	1.8E-004	1.8E-004
			2-Butanone		--			2-Butanone	liver	1.9E-001	--	9.9E+000	1.0E+001
			2-Hexanone		--			2-Hexanone	CNS	1.1E-005	--	5.5E-004	5.6E-004
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	1.2E-002	--	6.0E-001	6.1E-001
			2-Methylphenol		--			2-Methylphenol	liver	4.7E-004	--	2.4E-002	2.4E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	3.5E-003	--	1.8E-001	1.8E-001
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	4.7E-004	--	3.4E-002	3.5E-002
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	1.9E-006	--	1.2E-004	1.2E-004
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	8.6E-001	--	4.3E+001	4.4E+001
			4-Methylphenol		--			4-Methylphenol	respiratory	5.0E-003	--	3.8E-001	3.9E-001
			4-Nitrophenol		--			4-Nitrophenol	CNS	9.3E-006	--	4.7E-004	4.8E-004
			4,4'-DDD	1.4E-008	--	7.3E-007	7.4E-007	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	1.3E-005	--	6.7E-004	6.8E-004
			Acetone		--			Acetone	fetotoxic	3.8E-001	--	2.5E+001	2.5E+001
			Aluminum		--			Aluminum	circulatory	2.0E-002	--	1.0E+000	1.0E+000
			Anthracene		--			Anthracene	GI tract	4.5E-006	--	2.3E-004	2.3E-004
			Antimony		--			Antimony	skin	4.3E-001	--	2.2E+003	2.2E+003
			Aroclor-1242	2.3E-004	--	1.1E-002	1.2E-002	Aroclor-1242	liver		--		
			Aroclor-1248	1.0E-004	--	5.1E-003	5.3E-003	Aroclor-1248	liver		--		
			Aroclor-1254	3.5E-005	--	2.0E-003	2.0E-003	Aroclor-1254	liver	2.5E+000	--	1.4E+002	1.4E+002
			Aroclor-1260	2.9E-005	--	1.5E-003	1.5E-003	Aroclor-1260	circulatory		--		
			Arsenic	1.8E-005	--	9.8E-004	1.0E-003	Arsenic	circulatory	1.1E-001	--	6.1E+000	6.2E+000
			Barium		--			Barium		1.0E-001	--	5.2E+000	5.3E+000
			Benzene	1.8E-005	--	9.8E-004	1.0E-003	Benzene	blood disorders	5.8E-001	--	3.2E+001	3.2E+001
			Benzoic Acid		--			Benzoic Acid	GI tract	6.5E-005	--	3.3E-003	3.3E-003
			Benzo(a)anthracene	7.1E-007	--	3.6E-005	3.6E-005	Benzo(a)anthracene			--		
			Benzo(a)pyrene	4.1E-006	--	2.4E-004	2.5E-004	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.1E-006	--	5.8E-005	5.8E-005	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.1E-007	--	5.8E-006	5.9E-006	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	8.5E-004	--	4.3E+000	4.3E+000
			bis(2-Ethylhexyl)phthalate	5.0E-005	--	2.5E-003	2.6E-003	bis(2-Ethylhexyl)phthalate	liver	5.0E-001	--	2.5E+001	2.6E+001
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	3.7E-004	--	1.9E-002	1.9E-002
			Cadmium		--			Cadmium	kidney	1.9E+000	--	3.9E+003	3.9E+003
			Chlorobenzene		--			Chlorobenzene	liver	5.6E-002	--	9.2E+000	9.2E+000
			Chloroform	2.5E-011	--	1.3E-009	1.3E-009	Chloroform	circulatory	1.1E-006	--	5.9E-005	6.1E-005
			Chromium 3+		--			Chromium 3+	liver	2.8E-003	--	3.5E+001	3.5E+001
			Chrysene	4.7E-009	--	5.8E-007	5.8E-007	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	2.5E-006	--	1.2E-004	1.3E-004
			Cobalt		--			Cobalt	heart	2.8E-003	--	1.4E-001	1.4E-001
			Copper		--			Copper	liver	1.6E-001	--	1.4E+001	1.4E+001
			Cyanide (total)		--			Cyanide (total)	liver	3.7E-003	--	3.8E-001	3.8E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	1.8E-004	--	9.1E-003	9.3E-003
			Dibenzo(a,h)anthracene	7.9E-007	--	4.4E-005	4.5E-005	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	7.0E-006	--	3.5E-004	3.6E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	1.8E-006	--	9.1E-005	9.3E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	2.7E-003	--	1.4E-001	1.4E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		2.1E-003	--	1.1E-001	1.1E-001
			Ethyl Benzene		--			Ethyl Benzene	liver	2.6E-001	--	1.4E+001	1.4E+001
			Fluoranthene		--			Fluoranthene	kidney	1.7E-004	--	8.7E-003	8.8E-003
			Fluorene		--			Fluorene	skeletal	2.8E-005	--	1.4E-003	1.4E-003
			Indeno(1,2,3-cd)pyrene	2.4E-007	--	1.2E-005	1.2E-005	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		2.6E-001	--	1.3E+001	1.4E+001
			Isophorone	1.4E-008	--	6.9E-005	7.1E-005	Isophorone	kidney	2.0E-002	--	1.0E+000	1.0E+000
			Lead		--			Lead	CNS		--		

Table 6-3-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area3RME.v4.1.17.sum\_RUWa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Manganese		--			Manganese	kidney	8.7E-002	--	4.4E+000	4.5E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	8.2E-009	--	7.5E-007	7.5E-007	Methylene Chloride	liver	5.1E-005	--	4.6E-003	4.7E-003
			m,p-xylene		--			m,p-xylene	fetotoxic	6.8E-005	--	3.8E-003	3.9E-003
			Naphthalene		--			Naphthalene	circulatory	3.8E-002	--	1.9E+000	2.0E+000
			Nickel		--			Nickel	low body wt	1.1E-002	--	1.1E+001	1.1E+001
			N-Nitrosodiphenylamine		--			N-Nitrosodiphenylamine			--		
			ortho-xylene		--			ortho-xylene	fetotoxic	3.8E-005	--	2.1E-003	2.2E-003
			Pentachlorophenol	7.7E-007	--	3.9E-005	4.0E-005	Pentachlorophenol	liver	6.0E-004	--	3.0E-002	3.1E-002
			Phenol		--			Phenol	liver	1.6E-003	--	8.1E-002	8.3E-002
			Pyrene		--			Pyrene	liver	1.6E-004	--	7.9E-003	8.1E-003
			Selenium		--			Selenium	liver	3.5E-002	--	1.8E+000	1.8E+000
			Silver		--			Silver	skin	7.0E-002	--	1.7E+001	1.7E+001
			Styrene		--			Styrene	liver	1.7E-003	--	8.8E-002	9.0E-002
			Tetrachloroethene	9.6E-004	--	4.8E-002	4.9E-002	Tetrachloroethene	liver	5.2E+000	--	2.8E+002	2.7E+002
			Thallium		--			Thallium		2.4E-002	--	1.2E+000	1.2E+000
			Toluene		--			Toluene	liver	7.3E-001	--	3.7E+001	3.8E+001
			Trichloroethene	8.4E-005	--	4.3E-003	4.4E-003	Trichloroethene	liver	3.6E+000	--	1.8E+002	1.9E+002
			Vanadium		--			Vanadium	circulatory	7.7E-003	--	3.9E-001	3.9E-001
			Xylenes (total)		--			Xylenes (total)	fetotoxic	5.6E-002	--	3.2E+000	3.2E+000
			Zinc		--			Zinc	thyroid	5.9E-002	--	1.0E+001	1.0E+001
			(total)	1.5E-003	--	7.8E-002	7.9E-002	(total)		1.9E+001	--	6.9E+003	7.0E+003
	AIR	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	7.0E-004	--	7.0E-004
			1,1,1-Trichloroethane	--	--	--	6.6E-010	1,1,1-Trichloroethane	liver	--	1.5E-001	--	1.5E-001
			1,1,2-Trichloroethane	--	6.6E-010	--		1,1,2-Trichloroethane	liver	--	--	--	
			1,2-Dichlorobenzene	--	--	--	9.6E-007	1,2-Dichlorobenzene	low body weight	--	2.7E-004	--	2.7E-004
			1,2-Dichloroethane	--	9.6E-007	--		1,2-Dichloroethane	circulatory	--	2.1E-002	--	2.1E-002
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	1.8E-002	--	1.8E-002
			1,4-Dichlorobenzene	--	7.4E-009	--	7.4E-009	1,4-Dichlorobenzene	liver	--	4.1E-006	--	4.1E-006
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.9E-002	--	1.9E-002
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	2.0E-002	--	2.0E-002
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	7.4E-001	--	7.4E-001
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	
			Acetone	--	--	--		Acetone		--	--	--	
			Anthracene	--	--	--		Anthracene		--	--	--	
			Antimony	--	--	--		Antimony		--	--	--	
			Aroclor-1242	--	1.1E-005	--	1.1E-005	Aroclor-1242		--	--	--	
			Aroclor-1248	--	4.9E-006	--	4.9E-006	Aroclor-1248		--	--	--	
			Aroclor-1254	--	1.7E-006	--	1.7E-006	Aroclor-1254		--	--	--	
			Aroclor-1260	--	1.4E-006	--	1.4E-006	Aroclor-1260		--	--	--	
			Arsenic	--	2.2E-008	--	2.2E-006	Arsenic		--	--	--	
			Barium	--	--	--		Barium	respiratory	--	--	--	
			Benzene	--	7.7E-005	--	7.7E-005	Benzene	fetotoxic	--	2.8E+000	--	2.6E+000
			Benzoic Acid	--	--	--		Benzoic Acid	blood disorders	--	4.4E+000	--	4.4E+000
			Benzo(a)anthracene	--	--	--		Benzo(a)anthracene		--	--	--	
			Benzo(a)pyrene	--	1.0E-007	--	1.0E-007	Benzo(a)pyrene		--	--	--	
			Benzo(b)fluoranthene	--	--	--		Benzo(b)fluoranthene		--	--	--	
			Benzo(g,h,i)perylene	--	--	--		Benzo(g,h,i)perylene		--	--	--	
			Benzo(k)fluoranthene	--	--	--		Benzo(k)fluoranthene		--	--	--	
			Beryllium	--	1.5E-007	--	1.5E-007	Beryllium	respiratory	--	8.7E-003	--	8.7E-003
			bis(2-Ethylhexyl)phthalate	--	2.4E-006	--	2.4E-006	bis(2-Ethylhexyl)phthalate		--	--	--	

Table 6-3-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area3RME-0441TT-000-AW33RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	2.1E-004	--	2.1E-004	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	7.8E-010	--	7.8E-010
			Chlorobenzene	--		--		Chlorobenzene	liver	--	4.3E-001	--	4.3E-001
			Chloroethane	--		--		Chloroethane	fetotoxic	--	2.2E-010	--	2.2E-010
			Chloroform	--	5.0E-009	--	5.0E-009	Chloroform	liver	--	2.0E-003	--	2.0E-003
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	4.5E-004	--	4.5E-004	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	4.7E-002	--	4.7E-002
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Heptachlor	--	1.8E-009	--	1.8E-009	Heptachlor		--		--	
			Heptachlor epoxide	--	1.8E-009	--	1.8E-009	Heptachlor epoxide		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	3.4E+000	--	3.4E+000
			Mercury	--		--		Mercury	CNS	--	2.3E-002	--	2.3E-002
			Methylene Chloride	--	9.3E-008	--	9.3E-008	Methylene Chloride	respiratory	--	1.8E-004	--	1.8E-004
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	3.6E-001	--	3.6E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	8.4E-003	--	8.4E-003
			Tetrachloroethene	--	1.2E-005	--	1.2E-005	Tetrachloroethene	liver	--	1.2E-001	--	1.2E-001
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	3.0E-001	--	3.0E-001
			Trichloroethene	--	1.4E-004	--	1.4E-004	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	6.7E-011	--	6.7E-011	Vinyl Chloride	CNS	--		--	

Table 6-3-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Acep3RME.mxd, IT sum, RW23RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Xylenes (total)	--		--		Xylenes (total)				--	
			Zinc	--		--		Zinc	CNS	--		--	
			(total)		9.1E-004		9.1E-004	(total)			1.3E+001		1.3E+001
				Total Risk Across Soil				Index Across Soil					
				Total Risk Across All Media and All Exposure Routes									7.0E+003
													3.9E+003
													2.2E+003
													1.0E+001
													8.1E+002
													1.0E+001
													1.1E+000
													3.1E+001
													6.1E+001
													3.9E+000
													6.8E+004
													0.0E+000
													1.9E+002
													0.0E+000
													1.4E+001
													1.4E+003
													1.0E+001
													3.6E+001

Total Kidney HI:	3.9E+003
Total Skin HI:	2.2E+003
Total Thyroid HI:	1.0E+001
Total Liver HI:	8.1E+002
Total Circulatory System HI:	1.0E+001
Total CNS HI:	1.1E+000
Total Fetotoxic HI:	3.1E+001
Total GI Tract HI:	6.1E+001
Total Respiratory HI:	3.9E+000
Total Eyes HI:	6.8E+004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.9E+002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.4E+001
Total Skeletal System HI:	1.4E+003
Total Thyroid HI:	1.0E+001
Total Blood Disorders HI:	3.6E+001

Table 6-3-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area3CT, wk4, 1, 11, sum, f, wk43CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	7.5E-008	--	1.5E-004	1.5E-004
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	1.7E-001	--	3.3E+000	3.4E+000
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	2.9E-006	--	5.6E-005	5.9E-005
			1,2-Dichloroethane	2.3E-009	--	4.5E-008	4.7E-008	1,2-Dichloroethane	fetotoxic	1.2E-005	--	2.3E-004	2.4E-004
			1,2-Dichloroethane (total)		--			1,2-Dichloroethane (total)	kidney	1.3E-003	--	2.5E-002	2.6E-002
			1,2-Dichloropropane	1.2E-009	--	2.3E-008	2.4E-008	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	7.0E-011	--	1.4E-009	1.4E-009	1,4-Dichlorobenzene	GI tract	1.4E-006	--	2.7E-005	2.8E-005
			2-Butanone		--			2-Butanone	liver	7.2E-002	--	1.5E+000	1.6E+000
			2-Hexanone		--			2-Hexanone	CNS	4.3E-008	--	8.4E-005	8.8E-005
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	4.6E-003	--	9.0E-002	9.5E-002
			2-Methylphenol		--			2-Methylphenol	liver	1.8E-004	--	3.6E-003	3.8E-003
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.4E-003	--	2.7E-002	2.8E-002
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	1.8E-004	--	5.1E-003	5.3E-003
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	7.5E-007	--	1.8E-005	1.9E-005
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	3.3E-001	--	6.5E+000	6.9E+000
			4-Methylphenol		--			4-Methylphenol	respiratory	1.9E-003	--	5.8E-002	6.0E-002
			4-Nitrophenol		--			4-Nitrophenol	CNS	3.6E-008	--	7.1E-005	7.4E-005
			4,4'-DDD	1.1E-009	--	2.2E-008	2.3E-008	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	5.2E-006	--	1.0E-004	1.1E-004
			Acetone		--			Acetone	fetotoxic	1.5E-001	--	3.7E+000	3.9E+000
			Aluminum		--			Aluminum	circulatory	7.9E-003	--	1.5E-001	1.6E-001
			Anthracene		--			Anthracene	GI tract	1.8E-006	--	3.4E-005	3.6E-005
			Antimony		--			Antimony	skin	1.7E-001	--	3.3E+002	3.3E+002
			Aroclor-1242	1.8E-005	--	3.4E-004	3.6E-004	Aroclor-1242	liver		--		
			Aroclor-1248	8.0E-006	--	1.6E-004	1.6E-004	Aroclor-1248	liver		--		
			Aroclor-1254	2.8E-006	--	6.1E-005	6.3E-005	Aroclor-1254	liver	9.6E-001	--	2.1E+001	2.2E+001
			Aroclor-1260	2.3E-006	--	4.4E-005	4.6E-005	Aroclor-1260	circulatory		--		
			Arsenic	1.4E-006	--	3.0E-005	3.1E-005	Arsenic	circulatory	4.5E-002	--	9.2E-001	9.7E-001
			Barium		--			Barium		4.0E-002	--	7.8E-001	8.2E-001
			Benzene	1.4E-006	--	3.0E-005	3.1E-005	Benzene	blood disorders	2.2E-001	--	4.8E+000	5.0E+000
			Benzoic Acid		--			Benzoic Acid	GI tract	2.5E-005	--	4.9E-004	5.2E-004
			Benzo(a)anthracene	5.5E-008	--	1.1E-006	1.1E-006	Benzo(a)anthracene			--		
			Benzo(a)pyrene	3.2E-007	--	7.4E-006	7.7E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	8.9E-008	--	1.7E-006	1.8E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	8.9E-009	--	1.7E-007	1.8E-007	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	3.3E-004	--	6.4E-001	6.4E-001
			bis(2-Ethylhexyl)phthalate	3.9E-006	--	7.6E-005	8.0E-005	bis(2-Ethylhexyl)phthalate	liver	2.0E-001	--	3.8E+000	4.0E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	1.4E-004	--	2.8E-003	3.0E-003
			Cadmium		--			Cadmium	kidney	7.5E-001	--	5.8E+002	5.8E+002
			Chlorobenzene		--			Chlorobenzene	liver	2.2E-002	--	1.4E+000	1.4E+000
			Chloroform	1.9E-012	--	3.8E-011	4.1E-011	Chloroform	circulatory	4.4E-007	--	9.0E-006	9.4E-006
			Chromium 3+		--			Chromium 3+	liver	1.1E-003	--	5.4E+000	5.4E+000
			Chrysene	3.7E-010	--	1.7E-008	1.8E-008	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	9.6E-007	--	1.9E-005	2.0E-005
			Cobalt		--			Cobalt	heart	1.1E-003	--	2.1E-002	2.2E-002
			Copper		--			Copper	liver	6.3E-002	--	2.1E+000	2.1E+000
			Cyanide (total)		--			Cyanide (total)	liver	1.5E-003	--	5.7E-002	5.8E-002
			Dibenzofuran		--			Dibenzofuran	dec growth rate	7.0E-005	--	1.4E-003	1.4E-003
			Dibenzo(a,h)anthracene	6.2E-008	--	1.3E-006	1.4E-006	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	2.7E-006	--	5.4E-005	5.6E-005
			Dimethylphthalate		--			Dimethylphthalate	GI tract	7.0E-007	--	1.4E-005	1.4E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.1E-003	--	2.1E-002	2.2E-002
			Di-n-octylphthalate		--			Di-n-octylphthalate		8.3E-004	--	1.6E-002	1.7E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	1.0E-001	--	2.1E+000	2.2E+000
			Fluoranthene		--			Fluoranthene	kidney	6.7E-005	--	1.3E-003	1.4E-003
			Fluorene		--			Fluorene	skeletal	1.1E-005	--	2.1E-004	2.2E-004
			Indeno(1,2,3-cd)pyrene	1.9E-008	--	3.7E-007	3.9E-007	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		1.0E-001	--	2.0E+000	2.1E+000
			Isophorone	1.1E-007	--	2.1E-006	2.2E-006	Isophorone	kidney	7.9E-003	--	1.5E-001	1.6E-001
			Lead		--			Lead	CNS		--		

Scenario Timeframe: Current/Future  
 Receptor Population: Utility Worker  
 Receptor Age: Adult

Table 6-3-2  
 Summary of Receptor Risks and Hazards For COPCs  
 Central Tendency  
 American Chemical Services Site

File: Area3CT\_w411TT\_sum\_5/16/03T

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Manganese		--			Manganese	kidney	3.4E-002	--	6.6E-001	6.9E-001
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	6.3E-010	--	2.3E-008	2.3E-008	Methylene Chloride	liver	2.0E-005	--	7.0E-004	7.2E-004
			m,p-xylene		--			m,p-xylene	fetotoxic	2.6E-005	--	5.7E-004	6.0E-004
			Naphthalene		--			Naphthalene	circulatory	1.5E-002	--	2.9E-001	3.1E-001
			Nickel		--			Nickel	low body wt	4.3E-003	--	1.7E+000	1.7E+000
			N-Nitrosodiphenylamine		--			N-Nitrosodiphenylamine			--		
			ortho-xylene		--			ortho-xylene	fetotoxic	1.5E-005	--	3.2E-004	3.3E-004
			Pentachlorophenol	6.0E-008	--	1.2E-006	1.2E-006	Pentachlorophenol	liver	2.3E-004	--	4.6E-003	4.8E-003
			Phenol		--			Phenol	liver	6.3E-004	--	1.2E-002	1.3E-002
			Pyrene		--			Pyrene	liver	6.1E-005	--	1.2E-003	1.3E-003
			Selenium		--			Selenium	liver	1.4E-002	--	2.7E-001	2.8E-001
			Silver		--			Silver	skin	2.7E-002	--	2.5E+000	2.6E+000
			Styrene		--			Styrene	liver	6.8E-004	--	1.3E-002	1.4E-002
			Tetrachloroethene	7.5E-005	--	1.5E-003	1.5E-003	Tetrachloroethene	liver	2.0E+000	--	3.9E+001	4.1E+001
			Thallium		--			Thallium		9.4E-003	--	1.8E-001	1.9E-001
			Toluene		--			Toluene	liver	2.8E-001	--	5.6E+000	5.9E+000
			Trichloroethene	6.5E-006	--	1.3E-004	1.4E-004	Trichloroethene	liver	1.4E+000	--	2.8E+001	2.9E+001
			Vanadium		--			Vanadium	circulatory	3.0E-003	--	5.8E-002	6.1E-002
			Xylenes (total)		--			Xylenes (total)	fetotoxic	2.2E-002	--	4.8E-001	5.0E-001
			Zinc		--			Zinc	thyroid	2.3E-002	--	1.5E+000	1.5E+000
			(total)	1.2E-004	--	2.3E-003	2.5E-003	(total)		7.3E+000	--	1.0E+003	1.1E+003
	AIR	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	6.1E-004	--	6.1E-004
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	1.3E-001	--	1.3E-001
			1,1,2-Trichloroethane	--	1.2E-010	--	1.2E-010	1,1,2-Trichloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	2.4E-004	--	2.4E-004
			1,2-Dichloroethane	--	1.7E-007	--	1.7E-007	1,2-Dichloroethane	circulatory	--	1.8E-002	--	1.8E-002
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	1.6E-002	--	1.6E-002
			1,4-Dichlorobenzene	--	1.3E-009	--	1.3E-009	1,4-Dichlorobenzene	liver	--	3.6E-006	--	3.6E-006
			2-Butanone	--	--	--		2-Butanone	CNS	--	1.7E-002	--	1.7E-002
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	1.8E-002	--	1.8E-002
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	--
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	6.5E-001	--	6.5E-001
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	--
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	--
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	--
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	--
			Acetone	--	--	--		Acetone		--	--	--	--
			Anthracene	--	--	--		Anthracene		--	--	--	--
			Antimony	--	--	--		Antimony		--	--	--	--
			Aroclor-1242	--	1.9E-006	--	1.9E-006	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	8.5E-007	--	8.5E-007	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	3.0E-007	--	3.0E-007	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	2.4E-007	--	2.4E-007	Aroclor-1260		--	--	--	--
			Arsenic	--	3.8E-007	--	3.8E-007	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--		Barium	fetotoxic	--	2.3E+000	--	2.3E+000
			Benzene	--	1.3E-005	--	1.3E-005	Benzene	blood disorders	--	3.8E+000	--	3.8E+000
			Benzoic Acid	--	--	--		Benzoic Acid		--	--	--	--
			Benzo(a)anthracene	--	--	--		Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	1.8E-008	--	1.8E-008	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--		Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--		Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--		Benzo(k)fluoranthene		--	--	--	--
			Beryllium	--	2.6E-008	--	2.6E-008	Beryllium	respiratory	--	7.6E-003	--	7.6E-003
			bis(2-Ethylhexyl)phthalate	--	4.2E-007	--	4.2E-007	bis(2-Ethylhexyl)phthalate		--	--	--	--

Table 6-3-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: Area3CT-w44.LIT\_sum\_RNA3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Butylbenzylphthalate	-	-	-	-	Butylbenzylphthalate		-	-	-	-
			Cadmium	-	3.7E-005	-	3.7E-005	Cadmium		-	-	-	-
			Carbon Disulfide	-	-	-	-	Carbon Disulfide		-	6.9E-010	-	6.9E-010
			Chlorobenzene	-	-	-	-	Chlorobenzene	liver	-	3.8E-001	-	3.8E-001
			Chloroethane	-	-	-	-	Chloroethane	fetotoxic	-	1.9E-010	-	1.9E-010
			Chloroform	-	8.8E-010	-	8.8E-010	Chloroform	liver	-	1.8E-003	-	1.8E-003
			Chromium 3+	-	-	-	-	Chromium 3+		-	-	-	-
			Chromium 6+	-	7.8E-005	-	7.8E-005	Chromium 6+	respiratory	-	-	-	-
			Chrysene	-	-	-	-	Chrysene		-	-	-	-
			cis-1,2-Dichloroethene	-	-	-	-	cis-1,2-Dichloroethene		-	-	-	-
			Cobalt	-	-	-	-	Cobalt		-	-	-	-
			Copper	-	-	-	-	Copper		-	-	-	-
			Cyanide (total)	-	-	-	-	Cyanide (total)		-	-	-	-
			Dibenzofuran	-	-	-	-	Dibenzofuran		-	-	-	-
			Dibenzo(a,h)anthracene	-	-	-	-	Dibenzo(a,h)anthracene		-	-	-	-
			Diethylphthalate	-	-	-	-	Diethylphthalate		-	-	-	-
			Dimethylphthalate	-	-	-	-	Dimethylphthalate		-	-	-	-
			Di-n-butylphthalate	-	-	-	-	Di-n-butylphthalate		-	-	-	-
			Di-n-octylphthalate	-	-	-	-	Di-n-octylphthalate		-	-	-	-
			Ethyl Benzene	-	-	-	-	Ethyl Benzene	respiratory	-	4.1E-002	-	4.1E-002
			Fluoranthene	-	-	-	-	Fluoranthene		-	-	-	-
			Fluorene	-	-	-	-	Fluorene		-	-	-	-
			Heptachlor	-	3.2E-010	-	3.2E-010	Heptachlor		-	-	-	-
			Heptachlor epoxide	-	3.1E-010	-	3.1E-010	Heptachlor epoxide		-	-	-	-
			Indeno(1,2,3-cd)pyrene	-	-	-	-	Indeno(1,2,3-cd)pyrene		-	-	-	-
			Isophorone	-	-	-	-	Isophorone		-	-	-	-
			Lead	-	-	-	-	Lead		-	-	-	-
			Manganese	-	-	-	-	Manganese	respiratory	-	3.0E+000	-	3.0E+000
			Mercury	-	-	-	-	Mercury	CNS	-	2.0E-002	-	2.0E-002
			Methylene Chloride	-	1.6E-008	-	1.6E-008	Methylene Chloride	respiratory	-	1.6E-004	-	1.6E-004
			m,p-xylene	-	-	-	-	m,p-xylene		-	-	-	-
			Naphthalene	-	-	-	-	Naphthalene	circulatory	-	3.1E-001	-	3.1E-001
			Nickel	-	-	-	-	Nickel	respiratory	-	-	-	-
			N-Nitrosodiphenylamine	-	-	-	-	N-Nitrosodiphenylamine		-	-	-	-
			ortho-xylene	-	-	-	-	ortho-xylene		-	-	-	-
			Pentachlorophenol	-	-	-	-	Pentachlorophenol		-	-	-	-
			Phenanthrene	-	-	-	-	Phenanthrene		-	-	-	-
			Phenol	-	-	-	-	Phenol		-	-	-	-
			Pyrene	-	-	-	-	Pyrene		-	-	-	-
			Selenium	-	-	-	-	Selenium		-	-	-	-
			Silver	-	-	-	-	Silver		-	-	-	-
			Styrene	-	-	-	-	Styrene	CNS	-	7.4E-003	-	7.4E-003
			Tetrachloroethene	-	2.2E-006	-	2.2E-006	Tetrachloroethene	liver	-	1.1E-001	-	1.1E-001
			Thallium	-	-	-	-	Thallium		-	-	-	-
			Toluene	-	-	-	-	Toluene	CNS	-	2.6E-001	-	2.6E-001
			Trichloroethene	-	2.4E-005	-	2.4E-005	Trichloroethene	respiratory	-	-	-	-
			Vanadium	-	-	-	-	Vanadium		-	-	-	-
			Vinyl Chloride	-	1.2E-011	-	1.2E-011	Vinyl Chloride	CNS	-	-	-	-



Table 6-3-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe	Current/Future
Receptor Population	Utility Worker
Receptor Age	Adult

File: Area3C1.v441.IT\_sum\_A2Wv3C1

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Xylenes (total)	—	—	—	—	Xylenes (total)	CNS	—	—	—	—
			Zinc	—	—	—	—	Zinc		—	—	—	—
			(total)	—	1.6E-004	—	1.6E-004	(total)		—	1.1E+001	—	1.1E+001
Total Risk Across Subsurface Soil				2.6E-003				s Subsurface Soil					1.1E+003
Total Risk Across All Media and All Exposure Routes				Reserved									

Total Kidney HI:	5.9E+002
Total Skin HI:	3.3E+002
Total Thyroid HI:	1.5E+000
Total Liver HI:	1.3E+002
Total Circulatory System HI:	1.8E+000
Total CNS HI:	9.8E-001
Total Fetotoxic HI:	6.7E+000
Total GI Tract HI:	9.5E-002
Total Respiratory HI:	3.1E+000
Total Eyes HI:	1.1E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	3.0E-003
Total Adrenal HI:	0.0E+000
Total Heart HI:	2.2E-002
Total Skeletal System HI:	2.2E-004
Total Thyroid HI:	1.5E+000
Total Blood Disorders HI:	8.8E+000

Table 6-3-3  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area3RME.v04.1.TT\_sum\_RWv3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	1.7E-005	--	9.6E-004	9.8E-004
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	3.7E-001	--	2.2E+001	2.2E+001
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	6.4E-009	--	3.7E-004	3.8E-004
			1,2-Dichloroethane	2.6E-008	--	1.5E-006	1.5E-006	1,2-Dichloroethane	fetotoxic	2.6E-005	--	1.5E-003	1.6E-003
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	2.8E-003	--	1.6E-001	1.7E-001
			1,2-Dichloropropane	1.3E-008	--	7.6E-007	7.7E-007	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	7.8E-010	--	4.5E-008	4.6E-008	1,4-Dichlorobenzene	GI tract	3.0E-006	--	1.8E-004	1.8E-004
			2-Butanone		--			2-Butanone	liver	1.6E-001	--	9.9E+000	1.0E+001
			2-Hexanone		--			2-Hexanone	CNS	9.5E-006	--	5.5E-004	5.6E-004
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	1.0E-002	--	6.0E-001	6.1E-001
			2-Methylphenol		--			2-Methylphenol	liver	4.1E-004	--	2.4E-002	2.4E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	3.0E-003	--	1.8E-001	1.8E-001
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	4.1E-004	--	3.4E-002	3.4E-002
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	1.7E-006	--	1.2E-004	1.2E-004
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	7.5E-001	--	4.3E+001	4.4E+001
			4-Methylphenol		--			4-Methylphenol	respiratory	4.3E-003	--	3.8E-001	3.9E-001
			4-Nitrophenol		--			4-Nitrophenol	CNS	8.1E-006	--	4.7E-004	4.8E-004
			4,4'-DDD	1.3E-008	--	7.3E-007	7.4E-007	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	1.2E-005	--	6.7E-004	6.8E-004
			Acetone		--			Acetone	fetotoxic	3.3E-001	--	2.5E+001	2.5E+001
			Aluminum		--			Aluminum	circulatory	1.8E-002	--	1.0E+000	1.0E+000
			Anthracene		--			Anthracene	GI tract	3.9E-006	--	2.3E-004	2.3E-004
			Antimony		--			Antimony	skin	3.7E-001	--	2.2E+003	2.2E+003
			Aroclor-1242	2.0E-004	--	1.1E-002	1.2E-002	Aroclor-1242	liver		--		
			Aroclor-1248	8.9E-005	--	5.1E-003	5.2E-003	Aroclor-1248	liver		--		
			Aroclor-1254	3.1E-005	--	2.0E-003	2.0E-003	Aroclor-1254	liver	2.2E+000	--	1.4E+002	1.4E+002
			Aroclor-1260	2.5E-005	--	1.5E-003	1.5E-003	Aroclor-1260	circulatory		--		
			Arsenic	1.6E-005	--	9.8E-004	1.0E-003	Arsenic	circulatory	1.0E-001	--	6.1E+000	6.2E+000
			Barium		--			Barium		8.9E-002	--	5.2E+000	5.3E+000
			Benzene	1.5E-005	--	0.8E-004	9.9E-004	Benzene	blood disorders	4.9E-001	--	3.2E+001	3.2E+001
			Benzoic Acid		--			Benzoic Acid	GI tract	5.6E-005	--	3.3E-003	3.3E-003
			Benzo(a)anthracene	6.1E-007	--	3.6E-005	3.8E-005	Benzo(a)anthracene			--		
			Benzo(a)pyrene	3.8E-006	--	2.4E-004	2.5E-004	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	9.9E-007	--	5.8E-005	5.9E-005	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	9.9E-008	--	5.8E-006	5.9E-006	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	7.3E-004	--	4.3E+000	4.3E+000
			bis(2-Ethylhexyl)phthalate	4.4E-005	--	2.5E-003	2.6E-003	bis(2-Ethylhexyl)phthalate	liver	4.4E-001	--	2.5E+001	2.6E+001
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	3.2E-004	--	1.9E-002	1.9E-002
			Cadmium		--			Cadmium	kidney	1.7E+000	--	3.9E+003	3.9E+003
			Chlorobenzene		--			Chlorobenzene	liver	4.9E-002	--	9.2E+000	9.2E+000
			Chloroform	2.1E-011	--	1.3E-009	1.3E-009	Chloroform	circulatory	9.8E-007	--	5.9E-005	6.0E-005
			Chromium 3+		--			Chromium 3+	liver	2.4E-003	--	3.5E+001	3.5E+001
			Chrysene	4.1E-009	--	5.8E-007	5.8E-007	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	2.2E-008	--	1.2E-004	1.3E-004
			Cobalt		--			Cobalt	heart	2.4E-003	--	1.4E-001	1.4E-001
			Copper		--			Copper	liver	1.4E-001	--	1.4E+001	1.4E+001
			Cyanide (total)		--			Cyanide (total)	liver	3.2E-003	--	3.8E-001	3.8E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	1.6E-004	--	9.1E-003	9.2E-003
			Dibenzo(a,h)anthracene	8.9E-007	--	4.4E-005	4.5E-005	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	8.1E-006	--	3.5E-004	3.6E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	1.6E-006	--	9.1E-005	9.2E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	2.3E-003	--	1.4E-001	1.4E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		1.9E-003	--	1.1E-001	1.1E-001
			Ethyl Benzene		--			Ethyl Benzene	liver	2.3E-001	--	1.4E+001	1.4E+001
			Fluoranthene		--			Fluoranthene	kidney	1.5E-004	--	8.7E-003	8.8E-003
			Fluorene		--			Fluorene	skeletal	2.4E-005	--	1.4E-003	1.4E-003
			Indeno(1,2,3-cd)pyrene	2.1E-007	--	1.2E-005	1.2E-005	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		2.3E-001	--	1.3E+001	1.3E+001
			Isophorone	1.2E-006	--	6.9E-005	7.1E-005	Isophorone	kidney	1.8E-002	--	1.0E+000	1.0E+000
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	7.5E-002	--	4.4E+000	4.4E+000
			Mercury		--			Mercury	low body wt		--		

Table 6-3-3  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe	Future
Receptor Population	Routine Worker
Receptor Age	Adult

File: Area3RME.m41.LT\_sum\_BWa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Methylene Chloride	7.1E-009	--	7.5E-007	7.5E-007	Methylene Chloride	liver	4.4E-005	--	4.6E-003	4.7E-003
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	5.9E-005	--	3.8E-003	3.8E-003
			Naphthalene	--	--	--	--	Naphthalene	circulatory	3.3E-002	--	1.9E+000	2.0E+000
			Nickel	--	--	--	--	Nickel	low body wt	9.8E-003	--	1.1E+001	1.1E+001
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	3.3E-005	--	2.1E-003	2.1E-003
			Pentachlorophenol	6.7E-007	--	3.9E-005	4.0E-005	Pentachlorophenol	liver	5.2E-004	--	3.0E-002	3.1E-002
			Phenol	--	--	--	--	Phenol	liver	1.4E-003	--	8.1E-002	8.3E-002
			Pyrene	--	--	--	--	Pyrene	liver	1.4E-004	--	7.9E-003	8.1E-003
			Selenium	--	--	--	--	Selenium	liver	3.1E-002	--	1.8E+000	1.8E+000
			Silver	--	--	--	--	Silver	skin	6.1E-002	--	1.7E+001	1.7E+001
			Styrene	--	--	--	--	Styrene	liver	1.5E-003	--	8.8E-002	8.9E-002
			Tetrachloroethene	8.4E-004	--	4.8E-002	4.9E-002	Tetrachloroethene	liver	4.5E+000	--	2.6E+002	2.7E+002
			Thallium	--	--	--	--	Thallium	--	2.1E-002	--	1.2E+000	1.2E+000
			Toluene	--	--	--	--	Toluene	liver	6.4E-001	--	3.7E+001	3.8E+001
			Trichloroethene	7.3E-005	--	4.3E-003	4.4E-003	Trichloroethene	liver	3.1E+000	--	1.8E+002	1.9E+002
			Vanadium	--	--	--	--	Vanadium	circulatory	6.7E-003	--	3.9E-001	3.9E-001
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	4.9E-002	--	3.2E+000	3.2E+000
			Zinc	--	--	--	--	Zinc	thyroid	5.2E-002	--	1.0E+001	1.0E+001
			(total)	1.3E-003	--	7.8E-002	7.9E-002	(total)	--	1.6E+001	--	6.9E+003	7.0E+003
	AIR	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	6.2E-004	--	6.2E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	5.8E-002	--	5.8E-002
			1,1,2-Trichloroethane	--	1.8E-008	--	1.8E-008	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	3.3E-008	--	3.3E-008	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	9.8E-003	--	9.8E-003
			1,2-Dichloroethane	--	1.1E-006	--	1.1E-006	1,2-Dichloroethane	circulatory	--	2.5E-002	--	2.5E-002
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	4.1E-002	--	4.1E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	7.5E-005	--	7.5E-005
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	respiratory	--	1.0E-009	--	1.0E-009
			1,4-Dichlorobenzene	--	2.9E-008	--	2.9E-008	1,4-Dichlorobenzene	liver	--	1.6E-005	--	1.6E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	3.2E-006	--	3.2E-006
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	3.0E-001	--	3.0E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	2.6E-001	--	2.6E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4-Nitrophenol	--	--	--	--	4-Nitrophenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE	--	--	--	--	--
			4,4'-DDT	--	3.8E-012	--	3.8E-012	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Aldrin	--	6.0E-010	--	6.0E-010	Aldrin	--	--	--	--	--
			alpha-BHC	--	1.2E-011	--	1.2E-011	alpha-BHC	--	--	--	--	--
			Anthracene	--	--	--	--	Anthracene	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	--	--	--	--	--
			Aroclor-1242	--	2.3E-009	--	2.3E-009	Aroclor-1242	--	--	--	--	--
			Aroclor-1248	--	1.8E-009	--	1.8E-009	Aroclor-1248	--	--	--	--	--
			Aroclor-1254	--	1.3E-009	--	1.3E-009	Aroclor-1254	--	--	--	--	--
			Aroclor-1260	--	4.5E-009	--	4.5E-009	Aroclor-1260	--	--	--	--	--
			Arsenic	--	6.5E-009	--	6.5E-009	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	--	--	--
			Benzene	--	2.9E-005	--	2.9E-005	Benzene	blood disorders	--	1.6E+000	--	1.6E+000
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--

Scenario Timeframe: Future  
 Receptor Population: Routine Worker  
 Receptor Age: Adult

Table 6-3-3  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area3RME.wk4.1.T sum\_RWw3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	1.8E-010	--	1.8E-010	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	2.5E-010	--	2.5E-010	Beryllium	respiratory	--	1.4E-005	--	1.4E-005
			beta-BHC	--	6.6E-012	--	6.6E-012	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	6.3E-006	--	6.3E-006	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	8.4E-010	--	8.4E-010	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	1.0E-007	--	1.0E-007	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	2.8E-010	--	2.8E-010
			Chlorobenzene	--		--		Chlorobenzene	liver	--	4.5E-001	--	4.5E-001
			Chloroform	--	2.7E-006	--	2.7E-006	Chloroform	liver	--	1.1E+000	--	1.1E+000
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	4.1E-007	--	4.1E-007	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Dibenzo(a,h)anthracene	--		--		Dibenzo(a,h)anthracene		--		--	
			Dieldrin	--	3.1E-012	--	3.1E-012	Dieldrin		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endosulfan I	--		--		Endosulfan I		--		--	
			Endrin	--		--		Endrin		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	2.0E-002	--	2.0E-002
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--	1.4E-008	--	1.4E-008
			gamma-Chlordane	--	3.4E-013	--	3.4E-013	gamma-Chlordane		--		--	
			Heptachlor	--	3.5E-012	--	3.5E-012	Heptachlor		--		--	
			Heptachlor epoxide	--	3.3E-012	--	3.3E-012	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	9.5E-015	--	9.5E-015	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	6.6E-012	--	6.6E-012	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	7.6E-003	--	7.6E-003
			Mercury	--		--		Mercury	CNS	--	1.6E-005	--	1.6E-005
			Methylene Chloride	--	4.6E-007	--	4.6E-007	Methylene Chloride	respiratory	--	9.1E-004	--	9.1E-004
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	4.0E-001	--	4.0E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Phthalic anhydride	--		--		Phthalic anhydride		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	5.3E-003	--	5.3E-003
			Tetrachloroethene	--	7.0E-006	--	7.0E-006	Tetrachloroethene	liver	--	7.0E-002	--	7.0E-002
			Thallium	--		--		Thallium		--		--	

Table 6-3-3  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario	Timeframe	Future
Receptor Population	Routine Worker	
Receptor Age	Adult	

File Area3RME.mxd\LT\_sum\_RVW3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene	--		--		Toluene	CNS	--	2.5E-001	--	2.5E-001
			Trichloroethene	--	8.6E-005	--	6.6E-005	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	2.6E-007	--	2.6E-007	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		1.1E-004		1.1E-004	(total)			4.6E+000		4.6E+000
Total Risk Across Subsurface Soil							7.9E-002	rd Index Across Subsurface Soil					7.0E+003
Total Risk Across All Media and All Exposure Routes							Reserved	s Subsurface Soil					

Total Kidney HI:	3.9E+003
Total Skin HI:	2.2E+003
Total Thyroid HI:	1.0E+001
Total Liver HI:	8.1E+002
Total Circulatory System HI:	1.0E+001
Total CNS HI:	8.5E-001
Total Fetotoxic HI:	2.8E+001
Total GI Tract HI:	6.1E-001
Total Respiratory HI:	4.2E-001
Total Eyes HI:	8.8E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.9E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.4E-001
Total Skeletal System HI:	1.4E-003
Total Thyroid HI:	1.0E+001
Total Blood Disorders HI:	3.4E+001

Scenario	Timeframe	Future
Receptor Population		Routine Worker
Receptor Age		Adult

Table 6-3-4  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

File: Area3CT\_w411T sum\_RWA3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	7.3E-006	--	1.5E-004	1.5E-004
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	1.6E-001	--	3.3E+000	3.4E+000
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	2.8E-006	--	5.6E-005	5.9E-005
			1,2-Dichloroethane	2.3E-009	--	4.5E-008	4.7E-008	1,2-Dichloroethane	fetotoxic	1.2E-005	--	2.3E-004	2.4E-004
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	1.2E-003	--	2.5E-002	2.6E-002
			1,2-Dichloropropane	1.1E-009	--	2.3E-008	2.4E-008	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	6.8E-011	--	1.4E-009	1.4E-009	1,4-Dichlorobenzene	GI tract	1.3E-008	--	2.7E-005	2.8E-005
			2-Butanone		--			2-Butanone	liver	7.1E-002	--	1.5E+000	1.6E+000
			2-Hexanone		--			2-Hexanone	CNS	4.2E-006	--	8.4E-005	8.8E-005
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	4.5E-003	--	9.0E-002	9.5E-002
			2-Methylphenol		--			2-Methylphenol	liver	1.8E-004	--	3.6E-003	3.8E-003
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.3E-003	--	2.7E-002	2.8E-002
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	1.8E-004	--	5.1E-003	5.3E-003
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	7.3E-007	--	1.8E-005	1.9E-005
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	3.3E-001	--	6.5E+000	6.9E+000
			4-Methylphenol		--			4-Methylphenol	respiratory	1.9E-003	--	5.8E-002	6.0E-002
			4-Nitrophenol		--			4-Nitrophenol	CNS	3.5E-006	--	7.1E-005	7.4E-005
			4,4'-DDD	1.1E-009	--	2.2E-008	2.3E-008	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	5.1E-006	--	1.0E-004	1.1E-004
			Acetone		--			Acetone	fetotoxic	1.5E-001	--	3.7E+000	3.9E+000
			Aluminum		--			Aluminum	circulatory	7.7E-003	--	1.5E-001	1.6E-001
			Anthracene		--			Anthracene	GI tract	1.7E-006	--	3.4E-005	3.6E-005
			Antimony		--			Antimony	skin	1.6E-001	--	3.3E+002	3.3E+002
			Aroclor-1242	1.7E-005	--	3.4E-004	3.6E-004	Aroclor-1242	liver		--		
			Aroclor-1248	7.8E-006	--	1.6E-004	1.6E-004	Aroclor-1248	liver		--		
			Aroclor-1254	2.7E-006	--	6.1E-005	6.3E-005	Aroclor-1254	liver	9.4E-001	--	2.1E+001	2.2E+001
			Aroclor-1260	2.2E-006	--	4.4E-005	4.6E-005	Aroclor-1260	circulatory		--		
			Arsenic	1.4E-006	--	3.0E-005	3.1E-005	Arsenic	circulatory	4.4E-002	--	9.2E-001	9.6E-001
			Barium		--			Barium		3.9E-002	--	7.8E-001	8.2E-001
			Benzene	1.3E-006	--	3.0E-005	3.1E-005	Benzene	blood disorders	2.1E-001	--	4.8E+000	5.0E+000
			Benzoic Acid		--			Benzoic Acid	GI tract	2.5E-005	--	4.9E-004	5.2E-004
			Benzo(a)anthracene	5.4E-008	--	1.1E-006	1.1E-006	Benzo(a)anthracene			--		
			Benzo(a)pyrene	3.1E-007	--	7.4E-006	7.7E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	8.7E-008	--	1.7E-006	1.8E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	8.7E-009	--	1.7E-007	1.8E-007	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	3.2E-004	--	6.4E-001	6.4E-001
			bis(2-Ethylhexyl)phthalate	3.8E-006	--	7.6E-005	8.0E-005	bis(2-Ethylhexyl)phthalate	liver	1.9E-001	--	3.8E+000	4.0E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	1.4E-004	--	2.8E-003	3.0E-003
			Cadmium		--			Cadmium	kidney	7.3E-001	--	5.8E+002	5.8E+002
			Chlorobenzene		--			Chlorobenzene	liver	2.1E-002	--	1.4E+000	1.4E+000
			Chloroform	1.9E-012	--	3.9E-011	4.1E-011	Chloroform	circulatory	4.3E-007	--	9.0E-006	9.4E-006
			Chromium 3+		--			Chromium 3+	liver	1.1E-003	--	5.4E+000	5.4E+000
			Chrysene	3.6E-010	--	1.7E-008	1.8E-008	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	9.4E-007	--	1.9E-005	2.0E-005
			Cobalt		--			Cobalt	heart	1.1E-003	--	2.1E-002	2.2E-002
			Copper		--			Copper	liver	6.2E-002	--	2.1E+000	2.1E+000
			Cyanide (total)		--			Cyanide (total)	liver	1.4E-003	--	5.7E-002	5.8E-002
			Dibenzofuran		--			Dibenzofuran	dec growth rate	6.9E-005	--	1.4E-003	1.4E-003
			Dibenzo(a,h)anthracene	6.0E-008	--	1.3E-006	1.4E-006	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	2.7E-006	--	5.4E-005	5.6E-005
			Dimethylphthalate		--			Dimethylphthalate	GI tract	6.9E-007	--	1.4E-005	1.4E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.0E-003	--	2.1E-002	2.2E-002
			Di-n-octylphthalate		--			Di-n-octylphthalate		8.1E-004	--	1.6E-002	1.7E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	9.9E-002	--	2.1E+000	2.2E+000
			Fluoranthene		--			Fluoranthene	kidney	6.5E-005	--	1.3E-003	1.4E-003
			Fluorene		--			Fluorene	skeletal	1.1E-005	--	2.1E-004	2.2E-004
			Indeno(1,2,3-cd)pyrene	1.8E-008	--	3.7E-007	3.8E-007	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		1.0E-001	--	2.0E+000	2.1E+000
			Isophorone	1.0E-007	--	2.1E-008	2.2E-006	Isophorone	kidney	7.7E-003	--	1.5E-001	1.6E-001
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	3.3E-002	--	6.6E-001	6.9E-001
			Mercury		--			Mercury	low body wt		--		

Table 6-3-4  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area3CT.m4.1.TT.sum.RWp3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	Methylene Chloride	6.2E-010	--	2.3E-008	2.3E-008	Methylene Chloride	circulatory	7.9E-006	--	7.8E-004	7.9E-004
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	2.6E-005	--	5.7E-004	6.0E-004
			Naphthalene	--	--	--	--	Naphthalene	circulatory	1.5E-002	--	2.9E-001	3.1E-001
			Nickel	--	--	--	--	Nickel	low body wt	4.2E-003	--	1.7E+000	1.7E+000
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	fetotoxic	1.4E-005	--	3.2E-004	3.3E-004
			ortho-xylene	--	--	--	--	ortho-xylene	liver	2.3E-004	--	4.6E-003	4.8E-003
			Pentachlorophenol	5.9E-008	--	1.2E-006	1.2E-006	Pentachlorophenol	liver	6.1E-004	--	1.2E-002	1.3E-002
			Phenol	--	--	--	--	Phenol	liver	6.0E-005	--	1.2E-003	1.3E-003
			Pyrene	--	--	--	--	Pyrene	liver	1.3E-002	--	2.7E-001	2.8E-001
			Selenium	--	--	--	--	Selenium	skin	2.7E-002	--	2.5E+000	2.6E+000
			Silver	--	--	--	--	Silver	liver	6.6E-004	--	1.3E-002	1.4E-002
			Styrene	--	--	--	--	Styrene	liver	2.0E+000	--	3.9E+001	4.1E+001
			Tetrachloroethene	7.3E-005	--	1.5E-003	1.5E-003	Tetrachloroethene	liver	9.2E-003	--	1.8E-001	1.9E-001
			Thallium	--	--	--	--	Thallium	liver	2.8E-001	--	5.6E+000	5.9E+000
			Toluene	--	--	--	--	Toluene	liver	1.4E+000	--	2.8E+001	2.9E+001
			Trichloroethene	6.4E-006	--	1.3E-004	1.4E-004	Trichloroethene	circulatory	2.9E-003	--	5.8E-002	6.1E-002
			Vanadium	--	--	--	--	Vanadium	thyroid	2.1E-002	--	4.8E-001	5.0E-001
			Xylenes (total)	--	--	--	--	Xylenes (total)	thyroid	2.3E-002	--	1.5E+000	1.5E+000
			Zinc	--	--	--	--	Zinc	thyroid	7.1E+000	--	1.0E+003	1.1E+003
			(total)	1.2E-004	--	2.3E-003	2.5E-003	(total)					
AIR	AIR	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	5.4E-004	--	5.4E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	5.1E-002	--	5.1E-002
			1,1,2-Trichloroethane	--	3.2E-009	--	3.2E-009	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	5.7E-009	--	5.7E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	8.5E-003	--	8.5E-003
			1,2-Dichloroethane	--	2.0E-007	--	2.0E-007	1,2-Dichloroethane	circulatory	--	2.2E-002	--	2.2E-002
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane		--	3.6E-002	--	3.6E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	6.6E-005	--	6.6E-005
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	respiratory	--	8.8E-010	--	8.8E-010
			1,4-Dichlorobenzene	--	5.1E-009	--	5.1E-009	1,4-Dichlorobenzene	liver	--	1.4E-005	--	1.4E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	2.8E-006	--	2.8E-006
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	2.6E-001	--	2.6E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol		--	--	--	--
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	2.3E-001	--	2.3E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol		--	--	--	--
			4-Nitrophenol	--	--	--	--	4-Nitrophenol		--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE		--	--	--	--
			4,4'-DDT	--	6.7E-013	--	6.7E-013	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene		--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene		--	--	--	--
			Acetone	--	--	--	--	Acetone		--	--	--	--
			Aldrin	--	1.0E-010	--	1.0E-010	Aldrin		--	--	--	--
			alpha-BHC	--	2.1E-012	--	2.1E-012	alpha-BHC		--	--	--	--
			Anthracene	--	--	--	--	Anthracene		--	--	--	--
			Antimony	--	--	--	--	Antimony		--	--	--	--
			Aroclor-1242	--	4.0E-010	--	4.0E-010	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	3.2E-010	--	3.2E-010	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	2.3E-010	--	2.3E-010	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	7.9E-010	--	7.9E-010	Aroclor-1260		--	--	--	--
			Arsenic	--	1.1E-009	--	1.1E-009	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	2.0E-003	--	2.0E-003
			Benzene	--	5.0E-006	--	5.0E-006	Benzene	blood disorders	--	1.4E+000	--	1.4E+000
			Benzoic Acid	--	--	--	--	Benzoic Acid		--	--	--	--

Scenario Timeframe: Future  
 Receptor Population: Routine Worker  
 Receptor Age: Adult

Table 6-3-4  
 Summary of Receptor Risks and Hazards For COPCs  
 Central Tendency  
 American Chemical Services Site

File Area3CT\_v041 TT sum RWa3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	Benz(a,h)anthracene	—	—	—	—	Benz(a,h)anthracene	circulatory	7.3E-006	—	1.5E-004	1.5E-004
			Benzo(a)pyrene	—	3.1E-011	—	3.1E-011	Benzo(a)pyrene	—	—	—	—	—
			Benzo(b)fluoranthene	—	—	—	—	Benzo(b)fluoranthene	—	—	—	—	—
			Benzo(g,h,i)perylene	—	—	—	—	Benzo(g,h,i)perylene	—	—	—	—	—
			Benzo(k)fluoranthene	—	—	—	—	Benzo(k)fluoranthene	—	—	—	—	—
			Benzyl Alcohol	—	—	—	—	Benzyl Alcohol	—	—	—	—	—
			Beryllium	—	4.3E-011	—	4.3E-011	Beryllium	respiratory	—	1.3E-005	—	1.3E-005
			beta-BHC	—	1.2E-012	—	1.2E-012	beta-BHC	—	—	—	—	—
			bis(2-Chloroethyl) ether	—	1.1E-006	—	1.1E-006	bis(2-Chloroethyl) ether	liver	—	—	—	—
			bis(2-Ethylhexyl)phthalate	—	1.5E-010	—	1.5E-010	bis(2-Ethylhexyl)phthalate	—	—	—	—	—
			Butylbenzylphthalate	—	—	—	—	Butylbenzylphthalate	—	—	—	—	—
			Cadmium	—	1.8E-008	—	1.8E-008	Cadmium	—	—	—	—	—
			Carbon Disulfide	—	—	—	—	Carbon Disulfide	—	—	2.4E-010	—	2.4E-010
			Chlorobenzene	—	—	—	—	Chlorobenzene	liver	—	4.0E-001	—	4.0E-001
			Chloroform	—	4.7E-007	—	4.7E-007	Chloroform	liver	—	9.4E-001	—	9.4E-001
			Chromium 3+	—	—	—	—	Chromium 3+	—	—	—	—	—
			Chromium 6+	—	7.1E-008	—	7.1E-008	Chromium 6+	respiratory	—	—	—	—
			Chrysene	—	—	—	—	Chrysene	—	—	—	—	—
			cis-1,2-Dichloroethene	—	—	—	—	cis-1,2-Dichloroethene	—	—	—	—	—
			Cobalt	—	—	—	—	Cobalt	—	—	—	—	—
			Copper	—	—	—	—	Copper	—	—	—	—	—
			Cyanide (total)	—	—	—	—	Cyanide (total)	—	—	—	—	—
			Dibenzofuran	—	—	—	—	Dibenzofuran	—	—	—	—	—
			Dibenzo(a,h)anthracene	—	—	—	—	Dibenzo(a,h)anthracene	—	—	—	—	—
			Dieldrin	—	5.5E-013	—	5.5E-013	Dieldrin	—	—	—	—	—
			Diethylphthalate	—	—	—	—	Diethylphthalate	—	—	—	—	—
			Dimethylphthalate	—	—	—	—	Dimethylphthalate	—	—	—	—	—
			Di-n-butylphthalate	—	—	—	—	Di-n-butylphthalate	—	—	—	—	—
			Di-n-octylphthalate	—	—	—	—	Di-n-octylphthalate	—	—	—	—	—
			Endosulfan I	—	—	—	—	Endosulfan I	—	—	—	—	—
			Endrin	—	—	—	—	Endrin	—	—	—	—	—
			Endrin ketone	—	—	—	—	Endrin ketone	—	—	—	—	—
			Ethyl Benzene	—	—	—	—	Ethyl Benzene	respiratory	—	1.8E-002	—	1.8E-002
			Fluoranthene	—	—	—	—	Fluoranthene	—	—	—	—	—
			Fluorene	—	—	—	—	Fluorene	—	—	—	—	—
			gamma-Chlordane	—	6.0E-014	—	6.0E-014	gamma-Chlordane	—	—	1.2E-008	—	1.2E-008
			Heptachlor	—	6.1E-013	—	6.1E-013	Heptachlor	—	—	—	—	—
			Heptachlor epoxide	—	5.9E-013	—	5.9E-013	Heptachlor epoxide	—	—	—	—	—
			Hexachlorobenzene	—	1.7E-015	—	1.7E-015	Hexachlorobenzene	liver	—	—	—	—
			Hexachlorobutadiene	—	1.2E-012	—	1.2E-012	Hexachlorobutadiene	kidney	—	—	—	—
			Hexane, n-	—	—	—	—	Hexane, n-	—	—	—	—	—
			Indeno(1,2,3-cd)pyrene	—	—	—	—	Indeno(1,2,3-cd)pyrene	—	—	—	—	—
			Isophorone	—	—	—	—	Isophorone	—	—	—	—	—
			Lead	—	—	—	—	Lead	—	—	—	—	—
			Manganese	—	—	—	—	Manganese	respiratory	—	6.6E-003	—	6.6E-003
			Mercury	—	—	—	—	Mercury	CNS	—	1.4E-005	—	1.4E-005
			Methylene Chloride	—	8.1E-008	—	8.1E-008	Methylene Chloride	respiratory	—	8.0E-004	—	8.0E-004
			m,p-xylene	—	—	—	—	m,p-xylene	—	—	—	—	—
			Naphthalene	—	—	—	—	Naphthalene	circulatory	—	3.5E-001	—	3.5E-001
			Nickel	—	—	—	—	Nickel	respiratory	—	—	—	—
			N-Nitrosodiphenylamine	—	—	—	—	N-Nitrosodiphenylamine	—	—	—	—	—
			ortho-xylene	—	—	—	—	ortho-xylene	—	—	—	—	—
			Pentachlorophenol	—	—	—	—	Pentachlorophenol	—	—	—	—	—
			Phenanthrene	—	—	—	—	Phenanthrene	—	—	—	—	—
			Phenol	—	—	—	—	Phenol	—	—	—	—	—
			Phthalic anhydride	—	—	—	—	Phthalic anhydride	—	—	—	—	—
			Pyrene	—	—	—	—	Pyrene	—	—	—	—	—
			Selenium	—	—	—	—	Selenium	—	—	—	—	—
			Silver	—	—	—	—	Silver	—	—	—	—	—
			Styrene	—	—	—	—	Styrene	CNS	—	4.7E-003	—	4.7E-003
			Tetrachloroethene	—	1.2E-006	—	1.2E-006	Tetrachloroethene	liver	—	6.2E-002	—	6.2E-002
			Thallium	—	—	—	—	Thallium	—	—	—	—	—



Table 6-3-4  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: Area3C1.wk4.LTT\_sum\_RWA3C1

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	Trichloroethane	--	--	--	--	Trichloroethane	dermal	7.3E-006	2.2E-001	1.5E-004	2.8E-004
			Trichloroethene	--	1.2E-005	--	1.2E-005	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	--	--	--	--	--
			Vinyl Chloride	--	4.5E-008	--	4.5E-008	Vinyl Chloride	CNS	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc	--	--	--	--	--
			(total)		2.0E-005		2.0E-005	(total)			4.0E+000		4.0E+000
Total Risk Across Subsurface Soil							rd Index Across Subsurface Soil						
Total Risk Across All Media and All Exposure Routes							s Subsurface Soil						
Reserved							1.1E+000						

Total Kidney HI:	5.9E+002
Total Skin HI:	3.3E+002
Total Thyroid HI:	1.5E+000
Total Liver HI:	1.3E+002
Total Circulatory System HI:	1.9E+000
Total CNS HI:	7.2E-001
Total Fetotoxic HI:	4.4E+000
Total GI Tract HI:	9.5E-002
Total Respiratory HI:	8.5E-002
Total Eyes HI:	1.1E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	3.0E-003
Total Adrenal HI:	0.0E+000
Total Heart HI:	2.2E-002
Total Skeletal System HI:	2.2E-004
Total Thyroid HI:	1.5E+000
Total Blood Disorders HI:	6.4E+000

Scenario Timeframe: Future  
 Receptor Population: Construction Worker  
 Receptor Age: Adult

Table 6-3-5  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area3RME.wk4 \ TT\_sum \CWA3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 4')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	7.4E-006	--	8.9E-005	9.6E-005
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	2.2E-006	--	2.7E-005	2.9E-005
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	3.2E-005	--	3.9E-004	4.2E-004
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	4.1E-003	--	5.0E-002	5.4E-002
			1,2-Dichloropropane	6.8E-011	--	8.2E-010	8.9E-010	1,2-Dichloropropane	GI tract		--		
			2-Butanone		--			2-Butanone	liver	2.0E-003	--	2.5E-002	2.7E-002
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	1.4E-002	--	1.7E-001	1.8E-001
			2-Methylphenol		--			2-Methylphenol	liver	4.6E-004	--	5.6E-003	6.0E-003
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.2E-003	--	1.5E-002	1.6E-002
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	8.3E-006	--	1.2E-004	1.3E-004
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	3.1E-002	--	3.7E-001	4.0E-001
			4-Methylphenol		--			4-Methylphenol	respiratory	4.5E-003	--	8.4E-002	8.8E-002
			4,4'-DDD	1.9E-009	--	2.3E-008	2.5E-008	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	2.9E-005	--	3.6E-004	3.9E-004
			Acetone		--			Acetone	fetotoxic	4.8E-005	--	7.3E-004	7.8E-004
			Aluminum		--			Aluminum	circulatory	6.5E-002	--	7.8E-001	8.5E-001
			Anthracene		--			Anthracene	GI tract	1.1E-005	--	1.3E-004	1.4E-004
			Antimony		--			Antimony	skin	1.0E+000	--	1.3E+003	1.3E+003
			Aroclor-1242	2.9E-005	--	3.6E-004	3.9E-004	Aroclor-1242	liver		--		
			Aroclor-1248	1.3E-005	--	1.6E-004	1.7E-004	Aroclor-1248	liver		--		
			Aroclor-1254	2.3E-008	--	3.1E-005	3.4E-005	Aroclor-1254	liver	5.4E+000	--	7.3E+001	7.9E+001
			Aroclor-1260	3.8E-006	--	4.6E-005	5.0E-005	Aroclor-1260	circulatory		--		
			Arsenic	2.4E-006	--	3.1E-005	3.3E-005	Arsenic	circulatory	5.0E-001	--	6.4E+000	6.9E+000
			Barium		--			Barium		4.0E-001	--	4.9E+000	5.3E+000
			Benzene	4.9E-009	--	6.6E-008	7.0E-008	Benzene	blood disorders	5.2E-003	--	7.0E-002	7.6E-002
			Benzo(a)anthracene	9.2E-008	--	1.1E-008	1.2E-008	Benzo(a)anthracene			--		
			Benzo(a)pyrene	5.4E-007	--	7.6E-006	8.2E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.5E-007	--	1.8E-006	2.0E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.5E-008	--	1.8E-007	2.0E-007	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	3.7E-003	--	4.4E+000	4.5E+000
			bis(2-Ethylhexyl)phthalate	4.0E-007	--	4.8E-006	5.2E-006	bis(2-Ethylhexyl)phthalate	liver	1.3E-001	--	1.6E+000	1.7E+000
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	1.3E-003	--	1.5E-002	1.6E-002
			Cadmium		--			Cadmium	kidney	8.5E-001	--	4.1E+002	4.1E+002
			Chlorobenzene		--			Chlorobenzene	liver	1.5E-003	--	5.9E-002	6.1E-002
			Chloroform	3.2E-012	--	4.1E-011	4.4E-011	Chloroform	circulatory	4.9E-006	--	6.2E-005	6.7E-005
			Chromium 3+		--			Chromium 3+	liver	1.0E-002	--	3.0E+001	3.0E+001
			Chrysene	5.0E-010	--	1.5E-008	1.5E-008	Chrysene	liver		--		
			Cobalt		--			Cobalt	heart	1.2E-002	--	1.5E-001	1.8E-001
			Copper		--			Copper	liver	5.5E-001	--	1.1E+001	1.2E+001
			Cyanide (total)		--			Cyanide (total)	liver	1.6E-002	--	3.9E-001	4.1E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	5.3E-004	--	6.4E-003	6.9E-003
			Dibenzo(a,h)anthracene	1.0E-007	--	1.4E-006	1.5E-006	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	3.1E-005	--	3.7E-004	4.0E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	6.9E-007	--	8.3E-006	9.0E-006
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	4.6E-003	--	5.7E-002	6.2E-002
			Di-n-octylphthalate		--			Di-n-octylphthalate		9.3E-003	--	1.1E-001	1.2E-001
			Ethyl Benzene		--			Ethyl Benzene	liver	2.1E-001	--	2.8E+000	3.0E+000
			Fluoranthene		--			Fluoranthene	kidney	4.2E-004	--	5.0E-003	5.5E-003
			Fluorene		--			Fluorene	skeletal	7.6E-005	--	9.2E-004	1.0E-003
			Heptachlor	2.1E-008	--	2.5E-007	2.7E-007	Heptachlor	liver	8.6E-004	--	1.0E-002	1.1E-002
			Heptachlor epoxide	2.0E-008	--	2.4E-007	2.6E-007	Heptachlor epoxide	liver	1.6E-002	--	1.9E-001	2.1E-001
			Indeno(1,2,3-cd)pyrene	3.1E-008	--	3.8E-007	4.1E-007	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		1.1E+000	--	1.4E+001	1.5E+001
			Isophorone	9.5E-009	--	1.1E-007	1.2E-007	Isophorone	kidney	4.7E-003	--	5.6E-002	6.1E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	3.8E-001	--	4.6E+000	4.9E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	7.9E-011	--	1.7E-009	1.8E-009	Methylene Chloride	liver	1.6E-005	--	3.6E-004	3.8E-004
			Naphthalene		--			Naphthalene	circulatory	2.4E-002	--	2.9E-001	3.1E-001
			Nickel		--			Nickel	low body wt	4.8E-002	--	1.2E+001	1.2E+001

Table 6-3-5  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area3RME.wk4 \ TT\_sum\_fCWa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			N-Nitrosodiphenylamine		--			N-Nitrosodiphenylamine			--		
			ortho-xylene		--			ortho-xylene	fetotoxic	5.6E-008	--	7.6E-007	8.1E-007
			Pentachlorophenol	9.5E-009	--	1.1E-007	1.2E-007	Pentachlorophenol	liver	2.5E-004	--	3.0E-003	3.2E-003
			Phenol		--			Phenol	liver	2.3E-004	--	2.8E-003	3.0E-003
			Pyrene		--			Pyrene	liver	3.8E-004	--	4.5E-003	4.9E-003
			Selenium		--			Selenium	liver	1.7E-002	--	2.0E-001	2.2E-001
			Silver		--			Silver	skin	2.4E-002	--	1.4E+000	1.4E+000
			Styrene		--			Styrene	liver	5.6E-004	--	6.8E-003	7.4E-003
			Tetrachloroethene	2.2E-006	--	2.6E-005	2.8E-005	Tetrachloroethene	liver	3.9E-001	--	4.7E+000	5.1E+000
			Toluene		--			Toluene	liver	4.7E-001	--	5.6E+000	6.1E+000
			Trichloroethene	9.8E-008	--	1.2E-006	1.3E-006	Trichloroethene	liver	1.4E-001	--	1.7E+000	1.9E+000
			Vanadium		--			Vanadium	circulatory	3.3E-002	--	4.0E-001	4.4E-001
			Xylenes (total)		--			Xylenes (total)	fetotoxic	5.6E-002	--	7.6E-001	8.2E-001
			Zinc		--			Zinc	thyroid	2.6E-001	--	1.0E+001	1.1E+001
			(total)	5.5E-005	--	6.7E-004	7.3E-004	(total)		1.2E+001	--	1.9E+003	1.9E+003
	AIR	Area 3, Soil (0' to 4')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	9.61E-005	--	9.6E-005
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	3.11E-006	--	3.1E-006
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	8.55E-004	--	8.6E-004
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane		--	1.01E-003	--	1.0E-003
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	3.62E-003	--	3.6E-003
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol		--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	1.63E-001	--	1.6E-001
			4-Methylphenol	--	--	--	--	4-Methylphenol		--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD		--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene		--	--	--	--
			Acetone	--	--	--	--	Acetone		--	--	--	--
			Anthracene	--	--	--	--	Anthracene		--	--	--	--
			Antimony	--	--	--	--	Antimony		--	--	--	--
			Aroclor-1242	--	5.55E-007	--	5.5E-007	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	2.41E-007	--	2.4E-007	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	4.37E-008	--	4.4E-008	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	6.95E-008	--	7.0E-008	Aroclor-1260		--	--	--	--
			Arsenic	--	4.64E-007	--	4.6E-007	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	3.80E+000	--	3.8E+000
			Benzene	--	7.93E-008	--	7.9E-008	Benzene	blood disorders	--	1.50E-001	--	1.5E-001
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	4.76E-009	--	4.8E-009	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene		--	--	--	--
			Beryllium	--	1.27E-008	--	1.3E-008	Beryllium	respiratory	--	2.47E-002	--	2.5E-002
			bis(2-Ethylhexyl)phthalate	--	7.81E-009	--	7.8E-009	bis(2-Ethylhexyl)phthalate		--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate		--	--	--	--
			Cadmium	--	1.19E-006	--	1.2E-006	Cadmium		--	--	--	--
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	4.09E-002	--	4.1E-002
			Chloroform	--	7.19E-010	--	7.2E-010	Chloroform	liver	--	9.63E-003	--	9.6E-003
			Chromium 3+	--	--	--	--	Chromium 3+		--	--	--	--
			Chromium 6+	--	1.79E-005	--	1.8E-005	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene		--	--	--	--
			Cobalt	--	--	--	--	Cobalt		--	--	--	--
			Copper	--	--	--	--	Copper		--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)		--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran		--	--	--	--
			Dibenzo(a,h)anthracene	--	--	--	--	Dibenzo(a,h)anthracene		--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate		--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate		--	--	--	--

Table 6-3-5  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population	Construction Worker
Receptor Age:	Adult

File: Area3RME.wk4\TT\_sum\_ICWa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	6.79E-002	--	6.8E-002
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Heptachlor	--	4.34E-010	--	4.3E-010	Heptachlor		--		--	
			Heptachlor epoxide	--	4.19E-010	--	4.2E-010	Heptachlor epoxide		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	1.03E+001	--	1.0E+001
			Mercury	--		--		Mercury	CNS	--	1.11E-002	--	1.1E-002
			Methylene Chloride	--	3.07E-010	--	3.1E-010	Methylene Chloride	respiratory	--	2.02E-005	--	2.0E-005
			Naphthalene	--		--		Naphthalene	circulatory	--	3.60E-001	--	3.6E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	1.22E-003	--	1.2E-003
			Tetrachloroethene	--	4.98E-007	--	5.0E-007	Tetrachloroethene	liver	--	1.66E-001	--	1.7E-001
			Toluene	--		--		Toluene	CNS	--	3.90E-001	--	3.9E-001
			Trichloroethene	--	3.63E-007	--	3.6E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
					2.15E-005		2.1E-005	(total)			1.55E+001		1.6E+001
				Total Risk Across Subsurface Soil			7.5E-004		Total Hazard Index Across Subsurface Soil				1.9E+003
				Total Risk Across All Media and All Exposure Routes			Reserved						

Total Kidney HI:	4.2E+002
Total Skin HI:	1.3E+003
Total Thyroid HI:	1.1E+001
Total Liver HI:	1.4E+002
Total Circulatory System HI:	8.8E+000
Total CNS HI:	5.7E-001
Total Fetotoxic HI:	4.8E+000
Total GI Tract HI:	1.8E-001
Total Respiratory HI:	1.1E+001
Total Eyes HI:	3.9E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.8E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.6E-001
Total Skeletal System HI:	1.0E-003
Total Thyroid HI:	1.1E+001
Total Blood Disorders HI:	2.3E-001

Table 6-3-6  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area3RME.wk4.1.TT\_sum\_ICW10g3R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	8.3E-005	--	1.0E-003	1.1E-003
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	1.9E+000	--	2.3E+001	2.4E+001
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	3.2E-005	--	3.9E-004	4.2E-004
			1,2-Dichloroethane	3.9E-009	--	4.7E-008	5.1E-008	1,2-Dichloroethane	fetotoxic	1.3E-004	--	1.6E-003	1.7E-003
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	1.4E-002	--	1.7E-001	1.9E-001
			1,2-Dichloropropane	2.0E-009	--	2.4E-008	2.6E-008	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	1.2E-010	--	1.4E-009	1.5E-009	1,4-Dichlorobenzene	GI tract	1.5E-005	--	1.8E-004	2.0E-004
			2-Butanone		--			2-Butanone	liver	8.1E-001	--	1.0E+001	1.1E+001
			2-Hexanone		--			2-Hexanone	CNS	4.8E-005	--	5.8E-004	6.3E-004
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	5.2E-002	--	6.2E-001	6.7E-001
			2-Methylphenol		--			2-Methylphenol	liver	2.1E-003	--	2.5E-002	2.7E-002
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.5E-002	--	1.8E-001	2.0E-001
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	2.1E-003	--	3.6E-002	3.8E-002
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	8.3E-006	--	1.2E-004	1.3E-004
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	3.7E+000	--	4.5E+001	4.9E+001
			4-Methylphenol		--			4-Methylphenol	respiratory	2.2E-002	--	4.0E-001	4.2E-001
			4-Nitrophenol		--			4-Nitrophenol	CNS	4.1E-005	--	4.9E-004	5.3E-004
			4,4'-DDD	1.9E-009	--	2.3E-008	2.5E-008	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	5.8E-005	--	7.0E-004	7.6E-004
			Acetone		--			Acetone	fetotoxic	1.7E+000	--	2.6E+001	2.7E+001
			Aluminum		--			Aluminum	circulatory	8.8E-002	--	1.1E+000	1.2E+000
			Anthracene		--			Anthracene	GI tract	2.0E-005	--	2.4E-004	2.6E-004
			Antimony		--			Antimony	skin	1.9E+000	--	2.3E+003	2.3E+003
			Aroclor-1242	2.9E-005	--	3.6E-004	3.9E-004	Aroclor-1242	liver		--		
			Aroclor-1248	1.3E-005	--	1.6E-004	1.7E-004	Aroclor-1248	liver		--		
			Aroclor-1254	4.6E-006	--	6.3E-005	6.7E-005	Aroclor-1254	liver	1.1E+001	--	1.5E+002	1.6E+002
			Aroclor-1260	3.8E-006	--	4.8E-005	5.0E-005	Aroclor-1260	circulatory		--		
			Arsenic	2.4E-006	--	3.1E-005	3.3E-005	Arsenic	circulatory	5.0E-001	--	6.4E+000	6.9E+000
			Barium		--			Barium		4.5E-001	--	5.4E+000	5.9E+000
			Benzene	2.3E-006	--	3.1E-005	3.3E-005	Benzene	blood disorders	2.5E+000	--	3.3E+001	3.5E+001
			Benzoic Acid		--			Benzoic Acid	GI tract	2.8E-004	--	3.4E-003	3.7E-003
			Benzo(a)anthracene	9.2E-008	--	1.1E-006	1.2E-006	Benzo(a)anthracene			--		
			Benzo(a)pyrene	5.4E-007	--	7.6E-006	8.2E-006	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.5E-007	--	1.8E-006	2.0E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.5E-008	--	1.8E-007	2.0E-007	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	3.7E-003	--	4.4E+000	4.5E+000
			bis(2-Ethylhexyl)phthalate	6.6E-006	--	7.9E-005	8.6E-005	bis(2-Ethylhexyl)phthalate	liver	2.2E+000	--	2.6E+001	2.9E+001
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	1.6E-003	--	2.0E-002	2.1E-002
			Cadmium		--			Cadmium	kidney	8.3E+000	--	4.0E+003	4.0E+003
			Chlorobenzene		--			Chlorobenzene	liver	2.5E-001	--	9.6E+000	9.8E+000
			Chloroform	3.2E-012	--	4.1E-011	4.4E-011	Chloroform	circulatory	4.9E-006	--	6.2E-005	6.7E-005
			Chromium 3+		--			Chromium 3+	liver	1.2E-002	--	3.7E+001	3.7E+001
			Chrysene	6.1E-010	--	1.8E-008	1.9E-008	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	1.1E-005	--	1.3E-004	1.4E-004
			Cobalt		--			Cobalt	heart	1.2E-002	--	1.5E-001	1.6E-001
			Copper		--			Copper	liver	7.1E-001	--	1.4E+001	1.5E+001
			Cyanide (total)		--			Cyanide (total)	liver	1.6E-002	--	3.9E-001	4.1E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	7.9E-004	--	9.5E-003	1.0E-002
			Dibenzo(a,h)anthracene	1.0E-007	--	1.4E-006	1.5E-006	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	3.1E-005	--	3.7E-004	4.0E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	7.9E-006	--	9.5E-005	1.0E-004
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.2E-002	--	1.5E-001	1.6E-001
			Di-n-octylphthalate		--			Di-n-octylphthalate		9.3E-003	--	1.1E-001	1.2E-001
			Ethyl Benzene		--			Ethyl Benzene	liver	1.1E+000	--	1.5E+001	1.6E+001
			Fluoranthene		--			Fluoranthene	kidney	7.5E-004	--	9.0E-003	9.8E-003
			Fluorene		--			Fluorene	skeletal	1.2E-004	--	1.5E-003	1.6E-003
			Indeno(1,2,3-cd)pyrene	3.1E-008	--	3.8E-007	4.1E-007	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		1.1E+000	--	1.4E+001	1.5E+001
			Isophorone	1.8E-007	--	2.2E-006	2.4E-006	Isophorone	kidney	8.8E-002	--	1.1E+000	1.2E+000
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	3.8E-001	--	4.6E+000	4.9E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	1.1E-009	--	2.3E-008	2.4E-008	Methylene Chloride	liver	2.2E-004	--	4.9E-003	5.1E-003
			m,p-xylene		--			m,p-xylene	fetotoxic	2.9E-004	--	4.0E-003	4.2E-003

Table 6-3-6  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: Area3RME.wk4\1TT\_sum\_CW10a3R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Naphthalene		--			Naphthalene	circulatory	1.7E-001	--	2.0E+000	2.2E+000
			Nickel		--			Nickel	low body wt	4.8E-002	--	1.2E+001	1.2E+001
			N-Nitrosodiphenylamine		--			N-Nitrosodiphenylamine		--	--	--	--
			ortho-xylene		--			ortho-xylene	fetotoxic	1.6E-004	--	2.2E-003	2.4E-003
			Pentachlorophenol	1.0E-007	--	1.2E-006	1.3E-006	Pentachlorophenol	liver	2.6E-003	--	3.2E-002	3.4E-002
			Phenol		--			Phenol	liver	7.0E-003	--	8.5E-002	9.2E-002
			Pyrene		--			Pyrene	liver	6.9E-004	--	8.3E-003	9.0E-003
			Selenium		--			Selenium	liver	1.5E-001	--	1.9E+000	2.0E+000
			Silver		--			Silver	skin	3.1E-001	--	1.8E+001	1.8E+001
			Styrene		--			Styrene	liver	7.8E-003	--	9.2E-002	1.0E-001
			Tetrachloroethene	1.3E-004	--	1.5E-003	1.6E-003	Tetrachloroethene	liver	2.3E+001	--	2.7E+002	3.0E+002
			Thallium		--			Thallium		1.1E-001	--	1.3E+000	1.4E+000
			Toluene		--			Toluene	liver	3.2E+000	--	3.8E+001	4.2E+001
			Trichloroethene	1.1E-005	--	1.4E-004	1.5E-004	Trichloroethene	liver	1.8E+001	--	1.9E+002	2.1E+002
			Vanadium		--			Vanadium	circulatory	3.3E-002	--	4.0E-001	4.4E-001
			Xylenes (total)		--			Xylenes (total)	fetotoxic	2.5E-001	--	3.3E+000	3.6E+000
			Zinc		--			Zinc	thyroid	2.6E-001	--	1.0E+001	1.1E+001
			(Total)	2.0E-004	--	2.4E-003	2.6E-003	(Total)		8.1E+001	--	7.3E+003	7.3E+003
	Air	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	1.09E-003	--	1.1E-003
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	2.40E-001	--	2.4E-001
			1,1,2-Trichloroethane	--	3.09E-011	--	3.1E-011	1,1,2-Trichloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	4.24E-004	--	4.2E-004
			1,2-Dichloroethane	--	4.50E-008	--	4.5E-008	1,2-Dichloroethane	circulatory	--	3.30E-002	--	3.3E-002
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	2.82E-002	--	2.8E-002
			1,4-Dichlorobenzene	--	3.46E-010	--	3.5E-010	1,4-Dichlorobenzene	liver	--	6.41E-006	--	6.4E-006
			2-Butanone	--	--	--		2-Butanone	CNS	--	3.03E-002	--	3.0E-002
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	3.15E-002	--	3.2E-002
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--	--	--		2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	--
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.16E+000	--	1.2E+000
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	--
			4-Nitrophenol	--	--	--		4-Nitrophenol		--	--	--	--
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	--
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	--
			Acetone	--	--	--		Acetone		--	--	--	--
			Anthracene	--	--	--		Anthracene		--	--	--	--
			Antimony	--	--	--		Antimony		--	--	--	--
			Aroclor-1242	--	5.02E-007	--	5.0E-007	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	2.29E-007	--	2.3E-007	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	8.13E-008	--	8.1E-008	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	6.57E-008	--	6.6E-008	Aroclor-1260		--	--	--	--
			Arsenic	--	1.02E-007	--	1.0E-007	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--		Barium	fetotoxic	--	4.10E+000	--	4.1E+000
			Benzene	--	3.62E-006	--	3.6E-006	Benzene	blood disorders	--	6.85E+000	--	6.9E+000
			Benzoic Acid	--	--	--		Benzoic Acid		--	--	--	--
			Benzo(a)anthracene	--	--	--		Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	4.78E-009	--	4.8E-009	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--		Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--		Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--		Benzo(k)fluoranthene		--	--	--	--
			Beryllium	--	7.02E-009	--	7.0E-009	Beryllium	respiratory	--	1.37E-002	--	1.4E-002
			bis(2-Ethylhexyl)phthalate	--	1.13E-007	--	1.1E-007	bis(2-Ethylhexyl)phthalate		--	--	--	--
			Butylbenzylphthalate	--	--	--		Butylbenzylphthalate		--	--	--	--
			Cadmium	--	9.89E-006	--	9.9E-006	Cadmium		--	--	--	--
			Carbon Disulfide	--	--	--		Carbon Disulfide		--	1.23E-009	--	1.2E-009
			Chlorobenzene	--	--	--		Chlorobenzene	liver	--	6.76E-001	--	6.8E-001
			Chloroethane	--	--	--		Chloroethane	fetotoxic	--	3.39E-010	--	3.4E-010
			Chloroform	--	2.36E-010	--	2.4E-010	Chloroform	liver	--	3.16E-003	--	3.2E-003
			Chromium 3+	--	--	--		Chromium 3+		--	--	--	--
			Chromium 6+	--	2.10E-005	--	2.1E-005	Chromium 6+	respiratory	--	--	--	--

Table 6-3-6  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File Area3RME.wk4\T\_sum\_ICV10a3R

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Chrysene	--	--	--		Chrysene		--	--	--	
			cis-1,2-Dichloroethene	--	--	--		cis-1,2-Dichloroethene		--	--	--	
			Cobalt	--	--	--		Cobalt		--	--	--	
			Copper	--	--	--		Copper		--	--	--	
			Cyanide (total)	--	--	--		Cyanide (total)		--	--	--	
			Dibenzofuran	--	--	--		Dibenzofuran		--	--	--	
			Dibenzo(a,h)anthracene	--	--	--		Dibenzo(a,h)anthracene		--	--	--	
			Diethylphthalate	--	--	--		Diethylphthalate		--	--	--	
			Dimethylphthalate	--	--	--		Dimethylphthalate		--	--	--	
			Di-n-butylphthalate	--	--	--		Di-n-butylphthalate		--	--	--	
			Di-n-octylphthalate	--	--	--		Di-n-octylphthalate		--	--	--	
			Ethyl Benzene	--	--	--		Ethyl Benzene	respiratory	--	7.33E-002	--	7.3E-002
			Fluoranthene	--	--	--		Fluoranthene		--	--	--	
			Fluorene	--	--	--		Fluorene		--	--	--	
			Heptachlor	--	8.68E-011	--	8.7E-011	Heptachlor		--	--	--	
			Heptachlor epoxide	--	8.38E-011	--	8.4E-011	Heptachlor epoxide		--	--	--	
			Indeno(1,2,3-cd)pyrene	--	--	--		Indeno(1,2,3-cd)pyrene		--	--	--	
			Isophorone	--	--	--		Isophorone		--	--	--	
			Lead	--	--	--		Lead		--	--	--	
			Manganese	--	--	--		Manganese	respiratory	--	5.36E+000	--	5.4E+000
			Mercury	--	--	--		Mercury	CNS	--	3.67E-002	--	3.7E-002
			Methylene Chloride	--	4.38E-009	--	4.4E-009	Methylene Chloride	respiratory	--	2.88E-004	--	2.9E-004
			m,p-xylene	--	--	--		m,p-xylene		--	--	--	
			Naphthalene	--	--	--		Naphthalene	circulatory	--	5.60E-001	--	5.6E-001
			Nickel	--	--	--		Nickel	respiratory	--	--	--	
			N-Nitrosodiphenylamine	--	--	--		N-Nitrosodiphenylamine		--	--	--	
			ortho-xylene	--	--	--		ortho-xylene		--	--	--	
			Pentachlorophenol	--	--	--		Pentachlorophenol		--	--	--	
			Phenanthrene	--	--	--		Phenanthrene		--	--	--	
			Phenol	--	--	--		Phenol		--	--	--	
			Pyrene	--	--	--		Pyrene		--	--	--	
			Selenium	--	--	--		Selenium		--	--	--	
			Silver	--	--	--		Silver		--	--	--	
			Styrene	--	--	--		Styrene	CNS	--	1.32E-002	--	1.3E-002
			Tetrachloroethene	--	5.78E-007	--	5.8E-007	Tetrachloroethene	liver	--	1.93E-001	--	1.9E-001
			Thallium	--	--	--		Thallium		--	--	--	
			Toluene	--	--	--		Toluene	CNS	--	4.71E-001	--	4.7E-001
			Trichloroethene	--	6.55E-006	--	6.6E-006	Trichloroethene	respiratory	--	--	--	
			Vanadium	--	--	--		Vanadium		--	--	--	
			Vinyl Chloride	--	3.16E-012	--	3.2E-012	Vinyl Chloride	CNS	--	--	--	
			Xylenes (total)	--	--	--		Xylenes (total)	CNS	--	--	--	
			Zinc	--	--	--		Zinc		--	--	--	
			(total)		4.3E-005		4.3E-005	(total)			2.0E+001		2.0E+001
			Total Risk Across Subsurface Soil				2.7E-003	Total Hazard Index Across Subsurface Soil					7.4E+003

Total Risk Across All Media and All Exposure Routes

Reserved

Total Kidney HI:	4.1E+003
Total Skin HI:	2.3E+003
Total Thyroid HI:	1.1E+001
Total Liver HI:	9.0E+002
Total Circulatory System HI:	1.1E+001
Total CNS HI:	1.8E+000
Total Fetotoxic HI:	3.5E+001
Total GI Tract HI:	6.8E-001
Total Respiratory HI:	5.9E+000
Total Eyes HI:	7.6E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	2.1E-002
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.6E-001
Total Skeletal System HI:	1.6E-003
Total Thyroid HI:	1.1E+001
Total Blood Disorders HI:	4.2E+001

Table 6-3-7  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Current  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area3RME.wk4 \ TT\_sum\_cTa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 3, Surface Soil (0' to 2')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	4.4E-007	--	1.9E-005	2.0E-005
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	2.3E-007	--	1.0E-005	1.0E-005
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	3.3E-006	--	1.5E-004	1.5E-004
			1,2-Dichloroethene (total)		--			1,2-Dichloroethene (total)	kidney	4.3E-004	--	1.9E-002	1.9E-002
			1,2-Dichloropropane	5.5E-011	--	2.4E-009	2.5E-009	1,2-Dichloropropane	GI tract		--		
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	4.3E-004	--	1.9E-002	1.9E-002
			2-Methylphenol		--			2-Methylphenol	liver	4.8E-005	--	2.1E-003	2.1E-003
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.2E-004	--	5.5E-003	5.6E-003
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	8.8E-007	--	4.7E-005	4.8E-005
			4-Methylphenol		--			4-Methylphenol	respiratory	4.7E-004	--	3.2E-002	3.2E-002
			4,4'-DDD	1.5E-009	--	6.7E-008	6.8E-008	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	3.0E-006	--	1.3E-004	1.4E-004
			Acetone		--			Acetone	fetotoxic	6.6E-007	--	3.7E-005	3.8E-005
			Aluminum		--			Aluminum	circulatory	4.8E-003	--	2.1E-001	2.2E-001
			Anthracene		--			Anthracene	GI tract	1.1E-006	--	4.9E-005	5.0E-005
			Antimony		--			Antimony	skin	8.8E-002	--	3.8E+002	3.8E+002
			Aroclor-1242	3.6E-006	--	1.8E-004	1.6E-004	Aroclor-1242	liver		--		
			Aroclor-1248	2.3E-006	--	1.0E-004	1.0E-004	Aroclor-1248	liver		--		
			Aroclor-1254	1.9E-006	--	9.2E-005	9.4E-005	Aroclor-1254	liver	5.6E-001	--	2.8E+001	2.8E+001
			Arsenic	1.9E-006	--	9.0E-005	9.2E-005	Arsenic	circulatory	5.2E-002	--	2.4E+000	2.4E+000
			Barium		--			Barium		1.8E-002	--	7.8E-001	8.0E-001
			Benzene	3.9E-009	--	1.9E-007	2.0E-007	Benzene	blood disorders	5.4E-004	--	2.6E-002	2.7E-002
			Benzo(a)anthracene	7.4E-008	--	3.3E-006	3.3E-006	Benzo(a)anthracene			--		
			Benzo(b)fluoranthene	1.3E-008	--	5.8E-007	6.0E-007	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.3E-009	--	5.8E-008	6.0E-008	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	3.8E-004	--	1.7E+000	1.7E+000
			bis(2-Ethylhexyl)phthalate	2.5E-007	--	1.1E-005	1.1E-005	bis(2-Ethylhexyl)phthalate	liver	1.1E-002	--	4.8E-001	4.9E-001
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	4.3E-005	--	1.9E-003	1.9E-003
			Cadmium		--			Cadmium	kidney	8.1E-002	--	1.4E+002	1.4E+002
			Chlorobenzene		--			Chlorobenzene	liver	1.6E-004	--	2.2E-002	2.2E-002
			Chloroform	2.8E-012	--	1.2E-010	1.2E-010	Chloroform	circulatory	5.1E-007	--	2.3E-005	2.4E-005
			Chromium 3+		--			Chromium 3+	liver	4.4E-004	--	4.8E+000	4.8E+000
			Chrysene	4.0E-010	--	4.3E-008	4.3E-008	Chrysene	liver		--		
			Cobalt		--			Cobalt	heart	4.8E-004	--	2.1E-002	2.2E-002
			Copper		--			Copper	liver	1.5E-002	--	1.1E+000	1.1E+000
			Cyanide (total)		--			Cyanide (total)	liver	1.2E-003	--	1.1E-001	1.1E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	5.5E-005	--	2.4E-003	2.5E-003
			Diethylphthalate		--			Diethylphthalate	low body wt	9.5E-008	--	4.2E-006	4.3E-006
			Dimethylphthalate		--			Dimethylphthalate	GI tract	7.1E-008	--	3.1E-006	3.2E-006
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	7.6E-005	--	3.5E-003	3.5E-003
			Di-n-octylphthalate		--			Di-n-octylphthalate		3.3E-005	--	1.5E-003	1.5E-003
			Ethyl Benzene		--			Ethyl Benzene	liver	7.1E-004	--	3.4E-002	3.5E-002
			Fluoranthene		--			Fluoranthene	kidney	4.3E-005	--	1.9E-003	1.9E-003
			Fluorene		--			Fluorene	skeletal	7.7E-006	--	3.4E-004	3.5E-004
			Heptachlor	1.7E-008	--	7.4E-007	7.5E-007	Heptachlor	liver	8.9E-005	--	3.9E-003	4.0E-003
			Heptachlor epoxide	1.6E-008	--	7.1E-007	7.3E-007	Heptachlor epoxide	liver	1.8E-003	--	7.2E-002	7.4E-002
			Iron		--			Iron		2.1E-002	--	9.4E-001	9.7E-001
			Isophorone	1.6E-009	--	7.1E-008	7.2E-008	Isophorone	kidney	1.0E-004	--	4.5E-003	4.6E-003
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	3.9E-002	--	1.7E+000	1.8E+000
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	6.3E-011	--	5.1E-009	5.1E-009	Methylene Chloride	liver	1.7E-006	--	1.4E-004	1.4E-004
			Naphthalene		--			Naphthalene	circulatory	7.1E-004	--	3.1E-002	3.2E-002
			Nickel		--			Nickel	low body wt	1.3E-003	--	1.2E+000	1.2E+000
			N-Nitrosodiphenylamine		--			N-Nitrosodiphenylamine			--		
			Pentachlorophenol	7.6E-009	--	3.3E-007	3.4E-007	Pentachlorophenol	liver	2.5E-005	--	1.1E-003	1.1E-003
			Phenol		--			Phenol	liver	5.4E-006	--	2.4E-004	2.4E-004
			Pyrene		--			Pyrene	liver	3.9E-005	--	1.7E-003	1.7E-003
			Selenium		--			Selenium	liver	1.7E-003	--	7.7E-002	7.9E-002
			Styrene		--			Styrene	liver	5.8E-005	--	2.8E-003	2.8E-003
			Tetrachloroethene	5.5E-007	--	2.4E-005	2.5E-005	Tetrachloroethene	liver	1.3E-002	--	5.6E-001	5.7E-001
			Toluene		--			Toluene	liver	1.6E-003	--	7.1E-002	7.3E-002
			Trichloroethene	4.6E-008	--	2.1E-006	2.1E-006	Trichloroethene	liver	8.5E-003	--	3.8E-001	3.9E-001
			Vanadium		--			Vanadium	circulatory	1.9E-003	--	8.4E-002	8.5E-002



Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Table 6-3-7  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

File: Area3RME.wk4 \ TT\_sum\_cTa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Xylenes (total)		--			Xylenes (total)	fetotoxic	1.4E-004	--	7.1E-003	7.3E-003
			Zinc		--			Zinc	thyroid	2.6E-002	--	3.8E+000	3.8E+000
			(Total)	1.1E-005	--	4.8E-004	4.9E-004	(Total)		9.5E-001	--	5.7E+002	5.7E+002
AIR	Area 3, Surface Soil (0' to 2')		1,1-Dichloroethane	--	--	--		1,1-Dichloroethane	kidney	--	2.92E-005	--	2.9E-005
			1,1,1-Trichloroethane	--	--	--		1,1,1-Trichloroethane	liver	--	1.58E-005	--	1.6E-005
			1,1,2-Trichloroethane	--	7.44E-013	--	7.4E-013	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	8.31E-011	--	8.3E-011	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--		1,2-Dichlorobenzene	low body weight	--	8.41E-004	--	8.4E-004
			1,2-Dichloroethane	--	1.18E-008	--	1.2E-008	1,2-Dichloroethane	circulatory	--	1.11E-003	--	1.1E-003
			1,2-Dichloroethene (total)	--	--	--		1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--	--	--		1,2-Dichloropropane		--	1.42E-003	--	1.4E-003
			1,2,4-Trichlorobenzene	--	--	--		1,2,4-Trichlorobenzene	liver	--	6.33E-006	--	6.3E-006
			1,4-Dichlorobenzene	--	2.45E-010	--	2.4E-010	1,4-Dichlorobenzene	liver	--	5.83E-007	--	5.8E-007
			2-Butanone	--	--	--		2-Butanone	CNS	--	2.45E-009	--	2.5E-009
			2-Hexanone	--	--	--		2-Hexanone	CNS	--	2.39E-002	--	2.4E-002
			2-Methylnaphthalene	--	--	--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--	--	--		2-Methylphenol		--	--	--	--
			2,4-Dimethylphenol	--	--	--		2,4-Dimethylphenol		--	--	--	--
			2,4,5-Trichlorophenol	--	--	--		2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--	--	--		2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--		3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--		4-Methyl-2-pentanone	CNS	--	1.98E-004	--	2.0E-004
			4-Methylphenol	--	--	--		4-Methylphenol		--	--	--	--
			4,4'-DDD	--	--	--		4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--		4,4'-DDE		--	--	--	--
			4,4'-DDT	--	4.99E-014	--	5.0E-014	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--		Acenaphthene		--	--	--	--
			Acenaphthylene	--	--	--		Acenaphthylene		--	--	--	--
			Acetone	--	--	--		Acetone		--	--	--	--
			Aldrin	--	1.21E-011	--	1.2E-011	Aldrin		--	--	--	--
			alpha-BHC	--	2.45E-013	--	2.4E-013	alpha-BHC		--	--	--	--
			Anthracene	--	--	--		Anthracene		--	--	--	--
			Antimony	--	--	--		Antimony		--	--	--	--
			Aroclor-1242	--	2.15E-011	--	2.1E-011	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	2.40E-011	--	2.4E-011	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	2.48E-011	--	2.5E-011	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	8.14E-011	--	8.1E-011	Aroclor-1260		--	--	--	--
			Arsenic	--	4.18E-010	--	4.2E-010	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--		Barium	fetotoxic	--	1.96E-004	--	2.0E-004
			Benzene	--	2.44E-008	--	2.4E-008	Benzene	blood disorders	--	5.95E-003	--	5.9E-003
			Benzoic Acid	--	--	--		Benzoic Acid		--	--	--	--
			Benzo(a)anthracene	--	--	--		Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	5.53E-013	--	5.5E-013	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--		Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--		Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--		Benzo(k)fluoranthene		--	--	--	--
			Benzyl Alcohol	--	--	--		Benzyl Alcohol		--	--	--	--
			Beryllium	--	1.20E-011	--	1.2E-011	Beryllium	respiratory	--	3.00E-006	--	3.0E-006
			beta-BHC	--	1.33E-013	--	1.3E-013	beta-BHC		--	--	--	--
			bis(2-Chloroethyl) ether	--	1.18E-007	--	1.2E-007	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	5.89E-012	--	5.9E-012	bis(2-Ethylhexyl)phthalate		--	--	--	--
			Butylbenzylphthalate	--	--	--		Butylbenzylphthalate		--	--	--	--
			Cadmium	--	9.64E-010	--	9.6E-010	Cadmium		--	--	--	--
			Carbon Disulfide	--	--	--		Carbon Disulfide		--	1.20E-010	--	1.2E-010
			Chlorobenzene	--	--	--		Chlorobenzene	liver	--	2.86E-003	--	2.9E-003
			Chloroform	--	3.66E-008	--	3.7E-008	Chloroform	liver	--	6.31E-002	--	6.3E-002
			Chromium 3+	--	--	--		Chromium 3+		--	--	--	--
			Chromium 6+	--	7.75E-009	--	7.8E-009	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--		Chrysene		--	--	--	--
			cis-1,2-Dichloroethene	--	--	--		cis-1,2-Dichloroethene		--	--	--	--
			Cobalt	--	--	--		Cobalt		--	--	--	--
			Copper	--	--	--		Copper		--	--	--	--
			Cyanide (total)	--	--	--		Cyanide (total)		--	--	--	--
			Dibenzofuran	--	--	--		Dibenzofuran		--	--	--	--

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Table 6-3-7  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

File: Area3RME.wk4 \ TT\_sum\_cTa3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	6.15E-004	--	6.1E-004
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Heptachlor	--	3.50E-013	--	3.5E-013	Heptachlor		--		--	
			Heptachlor epoxide	--	3.38E-013	--	3.4E-013	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	9.56E-016	--	9.6E-016	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.25E-013	--	1.3E-013	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	1.19E-003	--	1.2E-003
			Mercury	--		--		Mercury	CNS	--	1.31E-006	--	1.3E-006
			Methylene Chloride	--	2.01E-009	--	2.0E-009	Methylene Chloride	respiratory	--	1.70E-005	--	1.7E-005
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	1.17E-002	--	1.2E-002
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	5.31E-005	--	5.3E-005
			Tetrachloroethene	--	1.31E-007	--	1.3E-007	Tetrachloroethene	liver	--	5.63E-003	--	5.6E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	1.80E-002	--	1.8E-002
			Trichloroethene	--	1.10E-007	--	1.1E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	5.15E-009	--	5.2E-009	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		4.5E-007		4.5E-007	(total)			1.4E-001		1.4E-001
Total Risk Across Surface Soil							4.9E-004	Total Hazard Index Across Surface Soil					5.7E+002
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	1.5E+002
Total Skin HI:	3.8E+002
Total Thyroid HI:	3.8E+000
Total Liver HI:	3.8E+001
Total Circulatory System HI:	2.8E+000
Total CNS HI:	4.2E-002
Total Fetotoxic HI:	7.5E-003
Total GI Tract HI:	1.9E-002
Total Respiratory HI:	3.4E-002
Total Eyes HI:	1.4E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.9E-003
Total Adrenal HI:	0.0E+000
Total Heart HI:	2.2E-002
Total Skeletal System HI:	3.5E-004
Total Thyroid HI:	3.8E+000
Total Blood Disorders HI:	3.3E-002

Scenario Timeframe: Current  
 Receptor Population: Trespasser  
 Receptor Age: Adolescent

Table 6-3-8  
 Summary of Receptor Risks and Hazards For COPCs  
 Central Tendency  
 American Chemical Services Site

File: Area3CT.wk4\TT\_sum\_cTa3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 3, Surface Soil (0' to 2')	1,1-Dichloroethane	—	—	—	—	1,1-Dichloroethane	circulatory	1.1E-007	—	1.6E-006	1.7E-006
			1,1,1-Trichloroethane	—	—	—	—	1,1,1-Trichloroethane	liver	5.9E-008	—	8.5E-007	9.1E-007
			1,2-Dichlorobenzene	—	—	—	—	1,2-Dichlorobenzene	CNS	8.6E-007	—	1.2E-005	1.3E-005
			1,2-Dichloroethane (total)	—	—	—	—	1,2-Dichloroethane (total)	kidney	1.1E-004	—	1.6E-003	1.7E-003
			1,2-Dichloropropane	1.2E-012	—	1.7E-011	1.9E-011	1,2-Dichloropropane	GI tract	—	—	—	—
			2-Methylnaphthalene	—	—	—	—	2-Methylnaphthalene	GI tract	1.1E-004	—	1.6E-003	1.7E-003
			2-Methylphenol	—	—	—	—	2-Methylphenol	liver	1.2E-005	—	1.8E-004	1.9E-004
			2,4-Dimethylphenol	—	—	—	—	2,4-Dimethylphenol	generalized	3.2E-005	—	4.6E-004	5.0E-004
			2,4,5-Trichlorophenol	—	—	—	—	2,4,5-Trichlorophenol	kidney	2.2E-007	—	4.0E-006	4.2E-006
			4-Methylphenol	—	—	—	—	4-Methylphenol	respiratory	1.2E-004	—	2.7E-003	2.8E-003
			4,4'-DDD	3.4E-011	—	4.9E-010	5.2E-010	4,4'-DDD	liver	—	—	—	—
			Acenaphthene	—	—	—	—	Acenaphthene	eyes	7.9E-007	—	1.1E-005	1.2E-005
			Acetone	—	—	—	—	Acetone	fetotoxic	1.7E-007	—	3.1E-006	3.3E-006
			Aluminum	—	—	—	—	Aluminum	circulatory	1.3E-003	—	1.8E-002	1.9E-002
			Anthracene	—	—	—	—	Anthracene	GI tract	2.9E-007	—	4.2E-006	4.5E-006
			Antimony	—	—	—	—	Antimony	skin	2.2E-002	—	3.2E+001	3.2E+001
			Aroclor-1242	7.9E-008	—	1.1E-006	1.2E-006	Aroclor-1242	liver	—	—	—	—
			Aroclor-1248	5.1E-008	—	7.3E-007	7.8E-007	Aroclor-1248	liver	—	—	—	—
			Aroclor-1254	4.1E-008	—	6.7E-007	7.1E-007	Aroclor-1254	liver	1.4E-001	—	2.3E+000	2.5E+000
			Arsenic	4.3E-008	—	6.5E-007	7.0E-007	Arsenic	circulatory	1.3E-002	—	2.0E-001	2.2E-001
			Barium	—	—	—	—	Barium	—	4.6E-003	—	6.7E-002	7.1E-002
			Benzene	8.7E-011	—	1.4E-009	1.5E-009	Benzene	blood disorders	1.4E-004	—	2.2E-003	2.4E-003
			Benzo(a)anthracene	1.6E-009	—	2.4E-008	2.5E-008	Benzo(a)anthracene	—	—	—	—	—
			Benzo(b)fluoranthene	2.9E-010	—	4.2E-009	4.5E-009	Benzo(b)fluoranthene	—	—	—	—	—
			Benzo(k)fluoranthene	2.9E-011	—	4.2E-010	4.5E-010	Benzo(k)fluoranthene	—	—	—	—	—
			Beryllium	—	—	—	—	Beryllium	kidney	9.9E-005	—	1.4E-001	1.4E-001
			bis(2-Ethylhexyl)phthalate	5.7E-009	—	8.1E-008	8.7E-008	bis(2-Ethylhexyl)phthalate	liver	2.8E-003	—	4.1E-002	4.4E-002
			Butylbenzylphthalate	—	—	—	—	Butylbenzylphthalate	mammary	1.1E-005	—	1.6E-004	1.7E-004
			Cadmium	—	—	—	—	Cadmium	kidney	2.1E-002	—	1.2E+001	1.2E+001
			Chlorobenzene	—	—	—	—	Chlorobenzene	liver	4.1E-005	—	1.9E-003	1.9E-003
			Chloroform	5.7E-014	—	8.6E-013	9.2E-013	Chloroform	circulatory	1.3E-007	—	2.0E-006	2.1E-006
			Chromium 3+	—	—	—	—	Chromium 3+	liver	1.1E-004	—	4.1E-001	4.1E-001
			Chrysene	8.9E-012	—	3.1E-010	3.2E-010	Chrysene	liver	—	—	—	—
			Cobalt	—	—	—	—	Cobalt	heart	1.2E-004	—	1.8E-003	1.9E-003
			Copper	—	—	—	—	Copper	liver	3.9E-003	—	9.4E-002	9.8E-002
			Cyanide (total)	—	—	—	—	Cyanide (total)	liver	3.2E-004	—	9.1E-003	9.4E-003
			Dibenzofuran	—	—	—	—	Dibenzofuran	dec growth rate	1.4E-005	—	2.0E-004	2.2E-004
			Diethylphthalate	—	—	—	—	Diethylphthalate	low body wt	2.5E-008	—	3.6E-007	3.8E-007
			Dimethylphthalate	—	—	—	—	Dimethylphthalate	GI tract	1.8E-008	—	2.7E-007	2.8E-007
			Di-n-butylphthalate	—	—	—	—	Di-n-butylphthalate	liver	2.0E-005	—	2.9E-004	3.1E-004
			Di-n-octylphthalate	—	—	—	—	Di-n-octylphthalate	—	8.5E-006	—	1.2E-004	1.3E-004
			Ethyl Benzene	—	—	—	—	Ethyl Benzene	liver	1.8E-004	—	2.9E-003	3.1E-003
			Fluoranthene	—	—	—	—	Fluoranthene	kidney	1.1E-005	—	1.6E-004	1.7E-004
			Fluorene	—	—	—	—	Fluorene	skeletal	2.0E-006	—	2.9E-005	3.1E-005
			Heptachlor	3.7E-010	—	5.4E-009	5.7E-009	Heptachlor	liver	2.3E-005	—	3.3E-004	3.6E-004
			Heptachlor epoxide	3.6E-010	—	5.2E-009	5.5E-009	Heptachlor epoxide	liver	4.2E-004	—	6.1E-003	6.5E-003
			Iron	—	—	—	—	Iron	—	5.6E-003	—	8.0E-002	8.6E-002
			Isophorone	3.6E-011	—	5.1E-010	5.5E-010	Isophorone	kidney	2.6E-005	—	3.8E-004	4.1E-004
			Lead	—	—	—	—	Lead	CNS	—	—	—	—
			Manganese	—	—	—	—	Manganese	kidney	1.0E-002	—	1.5E-001	1.6E-001
			Mercury	—	—	—	—	Mercury	low body wt	—	—	—	—
			Methylene Chloride	1.4E-012	—	3.7E-011	3.8E-011	Methylene Chloride	liver	4.4E-007	—	1.1E-005	1.2E-005
			Naphthalene	—	—	—	—	Naphthalene	circulatory	1.8E-004	—	2.7E-003	2.8E-003
			Nickel	—	—	—	—	Nickel	low body wt	3.5E-004	—	1.0E-001	1.0E-001
			N-Nitrosodiphenylamine	—	—	—	—	N-Nitrosodiphenylamine	—	—	—	—	—
			Pentachlorophenol	1.7E-010	—	2.4E-009	2.6E-009	Pentachlorophenol	liver	8.6E-006	—	9.5E-005	1.0E-004
			Phenol	—	—	—	—	Phenol	liver	1.4E-006	—	2.0E-005	2.2E-005
			Pyrene	—	—	—	—	Pyrene	liver	1.0E-005	—	1.5E-004	1.6E-004
			Selenium	—	—	—	—	Selenium	liver	4.5E-004	—	6.5E-003	7.0E-003
			Styrene	—	—	—	—	Styrene	liver	1.5E-005	—	2.2E-004	2.3E-004
			Tetrachloroethene	1.2E-008	—	1.8E-007	1.9E-007	Tetrachloroethene	liver	3.3E-003	—	4.7E-002	5.1E-002
			Toluene	—	—	—	—	Toluene	liver	4.2E-004	—	6.1E-003	6.5E-003
			Trichloroethene	1.0E-009	—	1.5E-008	1.6E-008	Trichloroethene	liver	2.2E-003	—	3.2E-002	3.4E-002
			Vanadium	—	—	—	—	Vanadium	circulatory	4.9E-004	—	7.1E-003	7.6E-003

Table 6-3-8  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: Area3CT.wk4 \ TT\_sum\_cTa3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Xylenes (total)		--			Xylenes (total)	fetotoxic	3.7E-005	--	6.0E-004	6.4E-004
			Zinc		--			Zinc	thyroid	6.7E-003	--	3.2E-001	3.3E-001
			(Total)	2.4E-007		3.5E-006	3.7E-006	(Total)		2.5E-001		4.8E+001	4.8E+001
AIR	Area 3, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	--	1,1-Dichloroethane	kidney	--	7.56E-006	--	7.6E-006
		1,1,1-Trichloroethane	--	--	--	--	--	1,1,1-Trichloroethane	liver	--	4.09E-006	--	4.1E-006
		1,1,2-Trichloroethane	--	1.65E-014	--	--	1.7E-014	1,1,2-Trichloroethane	liver	--	--	--	--
		1,1,2,2-Tetrachloroethane	--	1.85E-012	--	--	1.8E-012	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
		1,2-Dichlorobenzene	--	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	2.18E-004	--	2.2E-004
		1,2-Dichloroethane	--	2.61E-010	--	--	2.6E-010	1,2-Dichloroethane	circulatory	--	2.87E-004	--	2.9E-004
		1,2-Dichloroethane (total)	--	--	--	--	--	1,2-Dichloroethane (total)		--	--	--	--
		1,2-Dichloropropane	--	--	--	--	--	1,2-Dichloropropane		--	3.67E-004	--	3.7E-004
		1,2,4-Trichlorobenzene	--	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	1.64E-006	--	1.6E-006
		1,4-Dichlorobenzene	--	5.44E-012	--	--	5.4E-012	1,4-Dichlorobenzene	liver	--	1.51E-007	--	1.5E-007
		2-Butanone	--	--	--	--	--	2-Butanone	CNS	--	6.35E-010	--	6.4E-010
		2-Hexanone	--	--	--	--	--	2-Hexanone	CNS	--	6.18E-003	--	6.2E-003
		2-Methylnaphthalene	--	--	--	--	--	2-Methylnaphthalene		--	--	--	--
		2-Methylphenol	--	--	--	--	--	2-Methylphenol		--	--	--	--
		2,4-Dimethylphenol	--	--	--	--	--	2,4-Dimethylphenol		--	--	--	--
		2,4,5-Trichlorophenol	--	--	--	--	--	2,4,5-Trichlorophenol		--	--	--	--
		2,6-Dinitrotoluene	--	--	--	--	--	2,6-Dinitrotoluene		--	--	--	--
		3,3'-Dichlorobenzidine	--	--	--	--	--	3,3'-Dichlorobenzidine		--	--	--	--
		4-Methyl-2-pentanone	--	--	--	--	--	4-Methyl-2-pentanone	CNS	--	5.14E-005	--	5.1E-005
		4-Methylphenol	--	--	--	--	--	4-Methylphenol		--	--	--	--
		4,4'-DDD	--	--	--	--	--	4,4'-DDD		--	--	--	--
		4,4'-DDE	--	--	--	--	--	4,4'-DDE		--	--	--	--
		4,4'-DDT	--	1.11E-015	--	--	1.1E-015	4,4'-DDT	liver	--	--	--	--
		Acenaphthene	--	--	--	--	--	Acenaphthene		--	--	--	--
		Acenaphthylene	--	--	--	--	--	Acenaphthylene		--	--	--	--
		Acetone	--	--	--	--	--	Acetone		--	--	--	--
		Aldrin	--	2.88E-013	--	--	2.7E-013	Aldrin		--	--	--	--
		alpha-BHC	--	5.44E-015	--	--	5.4E-015	alpha-BHC		--	--	--	--
		Anthracene	--	--	--	--	--	Anthracene		--	--	--	--
		Antimony	--	--	--	--	--	Antimony		--	--	--	--
		Aroclor-1242	--	4.77E-013	--	--	4.8E-013	Aroclor-1242		--	--	--	--
		Aroclor-1248	--	5.34E-013	--	--	5.3E-013	Aroclor-1248		--	--	--	--
		Aroclor-1254	--	5.52E-013	--	--	5.5E-013	Aroclor-1254		--	--	--	--
		Aroclor-1260	--	1.81E-012	--	--	1.8E-012	Aroclor-1260		--	--	--	--
		Arsenic	--	9.28E-012	--	--	9.3E-012	Arsenic	respiratory	--	--	--	--
		Barium	--	--	--	--	--	Barium	fetotoxic	--	5.09E-005	--	5.1E-005
		Benzene	--	5.43E-010	--	--	5.4E-010	Benzene	blood disorders	--	1.54E-003	--	1.5E-003
		Benzoic Acid	--	--	--	--	--	Benzoic Acid		--	--	--	--
		Benzo(a)anthracene	--	--	--	--	--	Benzo(a)anthracene		--	--	--	--
		Benzo(a)pyrene	--	1.23E-014	--	--	1.2E-014	Benzo(a)pyrene		--	--	--	--
		Benzo(b)fluoranthene	--	--	--	--	--	Benzo(b)fluoranthene		--	--	--	--
		Benzo(g,h,i)perylene	--	--	--	--	--	Benzo(g,h,i)perylene		--	--	--	--
		Benzo(k)fluoranthene	--	--	--	--	--	Benzo(k)fluoranthene		--	--	--	--
		Benzyl Alcohol	--	--	--	--	--	Benzyl Alcohol		--	--	--	--
		Beryllium	--	2.66E-013	--	--	2.7E-013	Beryllium	respiratory	--	7.78E-007	--	7.8E-007
		beta-BHC	--	2.96E-015	--	--	3.0E-015	beta-BHC		--	--	--	--
		bis(2-Chloroethyl) ether	--	2.63E-009	--	--	2.6E-009	bis(2-Chloroethyl) ether	liver	--	--	--	--
		bis(2-Ethylhexyl)phthalate	--	1.31E-013	--	--	1.3E-013	bis(2-Ethylhexyl)phthalate		--	--	--	--
		Butylbenzylphthalate	--	--	--	--	--	Butylbenzylphthalate		--	--	--	--
		Cadmium	--	2.14E-011	--	--	2.1E-011	Cadmium		--	--	--	--
		Carbon Disulfide	--	--	--	--	--	Carbon Disulfide		--	3.12E-011	--	3.1E-011
		Chlorobenzene	--	--	--	--	--	Chlorobenzene	liver	--	7.41E-004	--	7.4E-004
		Chloroform	--	8.14E-010	--	--	8.1E-010	Chloroform	liver	--	1.64E-002	--	1.6E-002
		Chromium 3+	--	--	--	--	--	Chromium 3+		--	--	--	--
		Chromium 6+	--	1.72E-010	--	--	1.7E-010	Chromium 6+	respiratory	--	--	--	--
		Chrysene	--	--	--	--	--	Chrysene		--	--	--	--
		cis-1,2-Dichloroethane	--	--	--	--	--	cis-1,2-Dichloroethane		--	--	--	--
		Cobalt	--	--	--	--	--	Cobalt		--	--	--	--
		Copper	--	--	--	--	--	Copper		--	--	--	--
		Cyanide (total)	--	--	--	--	--	Cyanide (total)		--	--	--	--
		Dibenzofuran	--	--	--	--	--	Dibenzofuran		--	--	--	--

Table 6-3-8  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area3CT.wk4\TT\_sum\_cTa3CT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate	--	--	--	--	Diethylphthalate		--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate		--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate		--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate		--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone		--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	1.59E-004	--	1.6E-004
			Fluoranthene	--	--	--	--	Fluoranthene		--	--	--	--
			Fluorene	--	--	--	--	Fluorene		--	--	--	--
			Heptachlor	--	7.77E-015	--	7.8E-015	Heptachlor		--	--	--	--
			Heptachlor epoxide	--	7.50E-015	--	7.5E-015	Heptachlor epoxide		--	--	--	--
			Hexachlorobenzene	--	2.13E-017	--	2.1E-017	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	2.79E-015	--	2.8E-015	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Isophorone	--	--	--	--	Isophorone		--	--	--	--
			Lead	--	--	--	--	Lead		--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	3.08E-004	--	3.1E-004
			Mercury	--	--	--	--	Mercury	CNS	--	3.40E-007	--	3.4E-007
			Methylene Chloride	--	4.47E-011	--	4.5E-011	Methylene Chloride	respiratory	--	4.41E-006	--	4.4E-006
			m,p-xylene	--	--	--	--	m,p-xylene		--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	3.04E-003	--	3.0E-003
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine		--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene		--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol		--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene		--	--	--	--
			Phenol	--	--	--	--	Phenol		--	--	--	--
			Pyrene	--	--	--	--	Pyrene		--	--	--	--
			Selenium	--	--	--	--	Selenium		--	--	--	--
			Silver	--	--	--	--	Silver		--	--	--	--
			Styrene	--	--	--	--	Styrene	CNS	--	1.38E-005	--	1.4E-005
			Tetrachloroethene	--	2.92E-009	--	2.9E-009	Tetrachloroethene	liver	--	1.46E-003	--	1.5E-003
			Thallium	--	--	--	--	Thallium		--	--	--	--
			Toluene	--	--	--	--	Toluene	CNS	--	4.68E-003	--	4.7E-003
			Trichloroethene	--	2.45E-009	--	2.5E-009	Trichloroethene	respiratory	--	--	--	--
			Vanadium	--	--	--	--	Vanadium		--	--	--	--
			Vinyl Chloride	--	1.14E-010	--	1.1E-010	Vinyl Chloride	CNS	--	--	--	--
			Xylenes (total)	--	--	--	--	Xylenes (total)	CNS	--	--	--	--
			Zinc	--	--	--	--	Zinc		--	--	--	--
			(total)		1.0E-008		1.0E-008	(total)			3.5E-002		3.5E-002
Total Risk Across Surface Soil							3.8E-006	Total Hazard Index Across Surface Soil					4.8E+001
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	1.2E+001
Total Skin HI:	3.2E+001
Total Thyroid HI:	3.3E-001
Total Liver HI:	3.2E+000
Total Circulatory System HI:	2.5E-001
Total CNS HI:	1.1E-002
Total Fetotoxic HI:	6.9E-004
Total GI Tract HI:	1.7E-003
Total Respiratory HI:	3.3E-003
Total Eyes HI:	1.2E-005
Total Reproductive HI:	0.0E+000
Total Mammary HI:	1.7E-004
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.9E-003
Total Skeletal System HI:	3.1E-005
Total Thyroid HI:	3.3E-001
Total Blood Disorders HI:	3.9E-003

Scenario Timeframe: Future  
 Receptor Population: Trespasser  
 Receptor Age: Adolescent

Table 6-3-9  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area3RME.mxd LT - sum to 3000

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	8.6E-006	--	3.8E-004	3.9E-004
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	1.9E-001	--	8.5E+000	8.7E+000
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	3.3E-008	--	1.5E-004	1.5E-004
			1,2-Dichloroethane	3.1E-009	--	1.4E-007	1.4E-007	1,2-Dichloroethane	fetotoxic	1.4E-005	--	6.0E-004	6.2E-004
			1,2-Dichloroethane (total)		--			1,2-Dichloroethane (total)	kidney	1.5E-003	--	6.4E-002	6.6E-002
			1,2-Dichloropropane	1.6E-009	--	7.0E-008	7.1E-008	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	9.4E-011	--	4.2E-009	4.2E-009	1,4-Dichlorobenzene	GI tract	1.6E-006	--	8.9E-005	7.1E-005
			2-Butanone		--			2-Butanone	liver	8.4E-002	--	3.9E+000	4.0E+000
			2-Hexanone		--			2-Hexanone	CNS	4.9E-006	--	2.2E-004	2.2E-004
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	5.3E-003	--	2.3E-001	2.4E-001
			2-Methylphenol		--			2-Methylphenol	liver	2.1E-004	--	9.4E-003	9.6E-003
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	1.6E-003	--	8.9E-002	7.1E-002
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	2.1E-004	--	1.3E-002	1.4E-002
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	8.6E-007	--	4.7E-005	4.8E-005
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	3.9E-001	--	1.7E+001	1.7E+001
			4-Methylphenol		--			4-Methylphenol	respiratory	2.2E-003	--	1.5E-001	1.5E-001
			4-Nitrophenol		--			4-Nitrophenol	CNS	4.2E-006	--	1.8E-004	1.9E-004
			4,4'-DDD	1.5E-009	--	6.7E-008	6.8E-008	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	8.0E-006	--	2.6E-004	2.7E-004
			Acetone		--			Acetone	fetotoxic	1.7E-001	--	9.7E+000	9.8E+000
			Aluminum		--			Aluminum	circulatory	9.1E-003	--	4.0E-001	4.1E-001
			Anthracene		--			Anthracene	GI tract	2.0E-006	--	8.9E-005	9.1E-005
			Antimony		--			Antimony	skin	1.9E-001	--	8.5E+002	8.5E+002
			Aroclor-1242	2.4E-005	--	1.0E-003	1.1E-003	Aroclor-1242	liver		--		
			Aroclor-1248	1.1E-005	--	4.7E-004	4.8E-004	Aroclor-1248	liver		--		
			Aroclor-1254	3.7E-006	--	1.8E-004	1.9E-004	Aroclor-1254	liver	1.1E+000	--	5.5E+001	5.6E+001
			Aroclor-1260	3.0E-006	--	1.3E-004	1.4E-004	Aroclor-1260	circulatory		--		
			Arsenic	1.9E-006	--	9.0E-005	9.2E-005	Arsenic	circulatory	5.2E-002	--	2.4E+000	2.4E+000
			Barium		--			Barium		4.6E-002	--	2.0E+000	2.1E+000
			Benzene	1.8E-006	--	9.0E-005	9.2E-005	Benzene	blood disorders	2.5E-001	--	1.2E+001	1.3E+001
			Benzoic Acid		--			Benzoic Acid	GI tract	2.9E-005	--	1.3E-003	1.3E-003
			Benzo(a)anthracene	7.4E-008	--	3.3E-006	3.3E-006	Benzo(a)anthracene			--		
			Benzo(a)pyrene	4.3E-007	--	2.2E-005	2.3E-005	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	1.2E-007	--	5.3E-006	5.4E-006	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	1.2E-008	--	5.3E-007	5.4E-007	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	3.8E-004	--	1.7E+000	1.7E+000
			bis(2-Ethylhexyl)phthalate	5.3E-006	--	2.3E-004	2.4E-004	bis(2-Ethylhexyl)phthalate	liver	2.3E-001	--	9.9E+000	1.0E+001
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	1.7E-004	--	7.4E-003	7.5E-003
			Cadmium		--			Cadmium	kidney	8.9E-001	--	1.5E+003	1.5E+003
			Chlorobenzene		--			Chlorobenzene	liver	2.5E-002	--	3.6E+000	3.6E+000
			Chloroform	2.6E-012	--	1.2E-010	1.2E-010	Chloroform	circulatory	5.1E-007	--	2.3E-005	2.4E-005
			Chromium 3+		--			Chromium 3+	liver	1.3E-003	--	1.4E+001	1.4E+001
			Chrysene	4.9E-010	--	5.3E-008	5.3E-008	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	1.1E-006	--	4.9E-005	5.0E-005
			Cobalt		--			Cobalt	heart	1.3E-003	--	5.5E-002	5.6E-002
			Copper		--			Copper	liver	7.3E-002	--	5.4E+000	5.5E+000
			Cyanide (total)		--			Cyanide (total)	liver	1.7E-003	--	1.5E-001	1.5E-001
			Dibenzofuran		--			Dibenzofuran	dec growth rate	8.1E-005	--	3.6E-003	3.7E-003
			Dibenzo(a,h)anthracene	8.3E-008	--	4.1E-006	4.2E-006	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	3.2E-006	--	1.4E-004	1.4E-004
			Dimethylphthalate		--			Dimethylphthalate	GI tract	8.1E-007	--	3.8E-005	3.7E-005
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	1.2E-003	--	5.5E-002	5.6E-002
			Di-n-octylphthalate		--			Di-n-octylphthalate		9.8E-004	--	4.2E-002	4.3E-002
			Ethyl Benzene		--			Ethyl Benzene	liver	1.2E-001	--	5.6E+000	5.7E+000
			Fluoranthene		--			Fluoranthene	kidney	7.7E-005	--	3.4E-003	3.5E-003
			Fluorene		--			Fluorene	skeletal	1.2E-005	--	5.5E-004	5.6E-004
			Indeno(1,2,3-cd)pyrene	2.5E-008	--	1.1E-006	1.1E-006	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		1.2E-001	--	5.2E+000	5.3E+000
			Isophorone	1.4E-007	--	6.4E-006	6.5E-006	Isophorone	kidney	9.1E-003	--	4.0E-001	4.1E-001
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	3.9E-002	--	1.7E+000	1.8E+000

Table 6-3-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	8.6E-010	--	6.8E-008	6.9E-008	Methylene Chloride	liver	2.3E-005	--	1.8E-003	1.8E-003
			m,p-xylene		--			m,p-xylene	fetotoxic	3.0E-005	--	1.5E-003	1.5E-003
			Naphthalene		--			Naphthalene	circulatory	1.7E-002	--	7.6E-001	7.6E-001
			Nickel		--			Nickel	low body wt	5.0E-003	--	4.4E+000	4.4E+000
			N-Nitrosodiphenylamine		--			N-Nitrosodiphenylamine			--		
			ortho-xylene		--			ortho-xylene	fetotoxic	1.7E-005	--	8.3E-004	8.5E-004
			Pentachlorophenol	8.1E-008	--	3.6E-006	3.7E-006	Pentachlorophenol	liver	2.7E-004	--	1.2E-002	1.2E-002
			Phenol		--			Phenol	liver	7.3E-004	--	3.2E-002	3.3E-002
			Pyrene		--			Pyrene	liver	7.1E-005	--	3.1E-003	3.2E-003
			Selenium		--			Selenium	liver	1.6E-002	--	7.0E-001	7.2E-001
			Silver		--			Silver	skin	3.2E-002	--	6.6E+000	6.7E+000
			Styrene		--			Styrene	liver	7.9E-004	--	3.5E-002	3.5E-002
			Tetrachloroethene	1.0E-004	--	4.4E-003	4.5E-003	Tetrachloroethene	liver	2.3E+000	--	1.0E+002	1.0E+002
			Thallium		--			Thallium		1.1E-002	--	4.8E-001	4.9E-001
			Toluene		--			Toluene	liver	3.3E-001	--	1.5E+001	1.5E+001
			Trichloroethene	8.8E-006	--	4.0E-004	4.1E-004	Trichloroethene	liver	1.6E+000	--	7.2E+001	7.4E+001
			Vanadium		--			Vanadium	circulatory	3.5E-003	--	1.6E-001	1.6E-001
			Xylenes (total)		--			Xylenes (total)	fetotoxic	2.5E-002	--	1.2E+000	1.3E+000
			Zinc		--			Zinc	thyroid	2.7E-002	--	3.9E+000	3.9E+000
			(total)	1.6E-004		7.1E-003	7.3E-003	(total)		8.4E+000		2.7E+003	2.7E+003
	Air	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--		--		1,1-Dichloroethane	kidney	--	5.3E-005	--	5.3E-005
			1,1,1-Trichloroethane	--		--		1,1,1-Trichloroethane	liver	--	5.0E-003	--	5.0E-003
			1,1,2-Trichloroethane	--	3.7E-010	--	3.7E-010	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	6.6E-010	--	6.6E-010	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--		--		1,2-Dichlorobenzene	low body weight	--	8.4E-004	--	8.4E-004
			1,2-Dichloroethane	--	2.3E-008	--	2.3E-008	1,2-Dichloroethane	circulatory	--	2.1E-003	--	2.1E-003
			1,2-Dichloroethene (total)	--		--		1,2-Dichloroethene (total)		--	--	--	--
			1,2-Dichloropropane	--		--		1,2-Dichloropropane		--	3.6E-003	--	3.6E-003
			1,2,4-Trichlorobenzene	--		--		1,2,4-Trichlorobenzene	liver	--	6.5E-008	--	6.5E-008
			1,3-Dichlorobenzene	--		--		1,3-Dichlorobenzene	respiratory	--	8.7E-011	--	8.7E-011
			1,4-Dichlorobenzene	--	5.9E-010	--	5.9E-010	1,4-Dichlorobenzene	liver	--	1.4E-006	--	1.4E-006
			2-Butanone	--		--		2-Butanone	CNS	--	2.8E-007	--	2.8E-007
			2-Hexanone	--		--		2-Hexanone	CNS	--	2.6E-002	--	2.6E-002
			2-Methylnaphthalene	--		--		2-Methylnaphthalene		--	--	--	--
			2-Methylphenol	--		--		2-Methylphenol		--	--	--	--
			2,4-Dichlorophenol	--		--		2,4-Dichlorophenol		--	--	--	--
			2,4-Dimethylphenol	--		--		2,4-Dimethylphenol		--	--	--	--
			2,4-Dinitrotoluene	--		--		2,4-Dinitrotoluene		--	--	--	--
			2,4,5-Trichlorophenol	--		--		2,4,5-Trichlorophenol		--	--	--	--
			2,6-Dinitrotoluene	--		--		2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--		--		3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--		--		4-Methyl-2-pentanone	CNS	--	2.2E-002	--	2.2E-002
			4-Methylphenol	--		--		4-Methylphenol		--	--	--	--
			4-Nitrophenol	--		--		4-Nitrophenol		--	--	--	--
			4,4'-DDD	--		--		4,4'-DDD		--	--	--	--
			4,4'-DDE	--		--		4,4'-DDE		--	--	--	--
			4,4'-DDT	--	7.7E-014	--	7.7E-014	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--		--		Acenaphthene		--	--	--	--
			Acenaphthylene	--		--		Acenaphthylene		--	--	--	--
			Acetone	--		--		Acetone		--	--	--	--
			Aldrin	--	1.2E-011	--	1.2E-011	Aldrin		--	--	--	--
			alpha-BHC	--	2.4E-013	--	2.4E-013	alpha-BHC		--	--	--	--
			Anthracene	--		--		Anthracene		--	--	--	--
			Antimony	--		--		Antimony		--	--	--	--
			Aroclor-1242	--	4.7E-011	--	4.7E-011	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	3.7E-011	--	3.7E-011	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	2.6E-011	--	2.6E-011	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	9.1E-011	--	9.1E-011	Aroclor-1260		--	--	--	--
			Arsenic	--	1.3E-010	--	1.3E-010	Arsenic	respiratory	--	--	--	--
			Barium	--		--		Barium	fetotoxic	--	1.9E-004	--	1.9E-004

Scenario Timeframe: Future  
 Receptor Population: Trespasser  
 Receptor Age: Adolescent

Table 6-3-9  
 Summary of Receptor Risks and Hazards For COPCs  
 Reasonable Maximum Exposure  
 American Chemical Services Site

File: Area3RME.ppt LTT sum Ta3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Benzene	--	5.8E-007	--	5.8E-007	Benzene	blood disorders	--	1.4E-001	--	1.4E-001
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	3.6E-012	--	3.6E-012	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	--	--	--	--	--
			Beryllium	--	5.0E-012	--	5.0E-012	Beryllium	respiratory	--	1.3E-006	--	1.3E-006
			beta-BHC	--	1.3E-013	--	1.3E-013	beta-BHC	--	--	--	--	--
			bis(2-Chloroethyl) ether	--	1.3E-007	--	1.3E-007	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	1.7E-011	--	1.7E-011	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	2.1E-009	--	2.1E-009	Cadmium	--	--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	--	--	2.4E-011	--	2.4E-011
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	3.9E-002	--	3.9E-002
			Chloroform	--	5.4E-008	--	5.4E-008	Chloroform	liver	--	9.3E-002	--	9.3E-002
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	8.2E-009	--	8.2E-009	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Dibenzo(a,h)anthracene	--	--	--	--	Dibenzo(a,h)anthracene	--	--	--	--	--
			Dieldrin	--	6.3E-014	--	6.3E-014	Dieldrin	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Endosulfan I	--	--	--	--	Endosulfan I	--	--	--	--	--
			Endrin	--	--	--	--	Endrin	--	--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	1.8E-003	--	1.8E-003
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			gamma-Chlordane	--	6.9E-015	--	6.9E-015	gamma-Chlordane	--	--	1.2E-009	--	1.2E-009
			Heptachlor	--	7.0E-014	--	7.0E-014	Heptachlor	--	--	--	--	--
			Heptachlor epoxide	--	6.8E-014	--	6.8E-014	Heptachlor epoxide	--	--	--	--	--
			Hexachlorobenzene	--	1.9E-016	--	1.9E-016	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	1.3E-013	--	1.3E-013	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Isophorone	--	--	--	--	Isophorone	--	--	--	--	--
			Lead	--	--	--	--	Lead	--	--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	6.5E-004	--	6.5E-004
			Mercury	--	--	--	--	Mercury	CNS	--	1.4E-006	--	1.4E-006
			Methylene Chloride	--	9.3E-009	--	9.3E-009	Methylene Chloride	respiratory	--	7.8E-005	--	7.8E-005
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	3.4E-002	--	3.4E-002
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--
			Silver	--	--	--	--	Silver	--	--	--	--	--



Table 6-3-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area3RME.xls; IT\_sum\_Tx3RME

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Styrene	--		--		Styrene	CNS	--	4.8E-004	--	4.8E-004
			Tetrachloroethene	--	1.4E-007	--	1.4E-007	Tetrachloroethene	Liver	--	6.1E-003	--	6.1E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	2.2E-002	--	2.2E-002
			Trichloroethene	--	1.3E-006	--	1.3E-006	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	5.2E-009	--	5.2E-009	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		2.3E-006		2.3E-006	(total)			4.0E-001		4.0E-001
				Total Risk Across Subsurface Soil				Total Hazard Index Across Subsurface Soil					
													2.7E+003
				Total Risk Across All Media and All Exposure Routes									
													Reserved

Total Kidney HI:	1.5E+003
Total Skin HI:	8.5E+002
Total Thyroid HI:	3.9E+000
Total Liver HI:	3.2E+002
Total Circulatory System HI:	3.8E+000
Total CNS HI:	8.4E-002
Total Fetotoxic HI:	1.1E+001
Total GI Tract HI:	2.4E-001
Total Respiratory HI:	1.8E-001
Total Eyes HI:	2.7E-004
Total Reproductive HI:	0.0E+000
Total Mammary HI:	7.5E-003
Total Adrenal HI:	0.0E+000
Total Heart HI:	5.8E-002
Total Skeletal System HI:	5.8E-004
Total Thyroid HI:	3.9E+000
Total Blood Disorders HI:	1.3E+001

Table 6-3-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area3CT\_v4.1.IT\_sum\_Ta3CT\_v4.1

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Soil	Soil	Area 3, Soil (0' to 10')	1,1-Dichloroethane		--			1,1-Dichloroethane	circulatory	2.2E-006	--	3.2E-005	3.4E-005
			1,1,1-Trichloroethane		--			1,1,1-Trichloroethane	liver	5.0E-002	--	7.2E-001	7.7E-001
			1,2-Dichlorobenzene		--			1,2-Dichlorobenzene	CNS	8.6E-007	--	1.2E-005	1.3E-005
			1,2-Dichloroethane	6.9E-011	--	1.0E-009	1.1E-009	1,2-Dichloroethane	fetotoxic	3.6E-006	--	5.1E-005	5.5E-005
			1,2-Dichloroethane (total)		--			1,2-Dichloroethane (total)	kidney	3.8E-004	--	5.5E-003	5.9E-003
			1,2-Dichloropropane	3.5E-011	--	5.1E-010	5.4E-010	1,2-Dichloropropane	GI tract		--		
			1,4-Dichlorobenzene	2.1E-012	--	3.0E-011	3.2E-011	1,4-Dichlorobenzene	GI tract	4.1E-007	--	5.9E-006	6.3E-006
			2-Butanone		--			2-Butanone	liver	2.2E-002	--	3.3E-001	3.5E-001
			2-Hexanone		--			2-Hexanone	CNS	1.3E-006	--	1.8E-005	2.0E-005
			2-Methylnaphthalene		--			2-Methylnaphthalene	GI tract	1.4E-003	--	2.0E-002	2.1E-002
			2-Methylphenol		--			2-Methylphenol	liver	5.5E-005	--	8.0E-004	8.5E-004
			2,4-Dimethylphenol		--			2,4-Dimethylphenol	generalized	4.1E-004	--	5.9E-003	6.3E-003
			2,4-Dinitrotoluene		--			2,4-Dinitrotoluene	CNS	5.5E-005	--	1.1E-003	1.2E-003
			2,4,5-Trichlorophenol		--			2,4,5-Trichlorophenol	kidney	2.2E-007	--	4.0E-006	4.2E-006
			4-Methyl-2-pentanone		--			4-Methyl-2-pentanone	liver	1.0E-001	--	1.4E+000	1.5E+000
			4-Methylphenol		--			4-Methylphenol	respiratory	5.8E-004	--	1.3E-002	1.3E-002
			4-Nitrophenol		--			4-Nitrophenol	CNS	1.1E-006	--	1.6E-005	1.7E-005
			4,4'-DDD	3.4E-011	--	4.9E-010	5.2E-010	4,4'-DDD	liver		--		
			Acenaphthene		--			Acenaphthene	eyes	1.6E-006	--	2.2E-005	2.4E-005
			Acetone		--			Acetone	fetotoxic	4.5E-002	--	8.2E-001	8.6E-001
			Aluminum		--			Aluminum	circulatory	2.4E-003	--	3.4E-002	3.6E-002
			Anthracene		--			Anthracene	GI tract	5.3E-007	--	7.6E-006	8.1E-006
			Antimony		--			Antimony	skin	5.0E-002	--	7.2E+001	7.2E+001
			Aroclor-1242	5.3E-007	--	7.6E-006	8.1E-006	Aroclor-1242	liver		--		
			Aroclor-1248	2.4E-007	--	3.4E-006	3.7E-006	Aroclor-1248	liver		--		
			Aroclor-1254	8.3E-008	--	1.3E-006	1.4E-006	Aroclor-1254	liver	2.9E-001	--	4.7E+000	5.0E+000
			Aroclor-1260	6.8E-008	--	9.7E-007	1.0E-006	Aroclor-1260	circulatory		--		
			Arsenic	4.3E-008	--	6.5E-007	7.0E-007	Arsenic	circulatory	1.3E-002	--	2.0E-001	2.2E-001
			Barium		--			Barium		1.2E-002	--	1.7E-001	1.9E-001
			Benzene	4.1E-008	--	6.5E-007	6.9E-007	Benzene	blood disorders	6.6E-002	--	1.1E+000	1.1E+000
			Benzoic Acid		--			Benzoic Acid	GI tract	7.6E-006	--	1.1E-004	1.2E-004
			Benzo(a)anthracene	1.6E-009	--	2.4E-008	2.5E-008	Benzo(a)anthracene			--		
			Benzo(a)pyrene	9.6E-009	--	1.6E-007	1.7E-007	Benzo(a)pyrene			--		
			Benzo(b)fluoranthene	2.7E-009	--	3.9E-008	4.1E-008	Benzo(b)fluoranthene			--		
			Benzo(k)fluoranthene	2.7E-010	--	3.9E-009	4.1E-009	Benzo(k)fluoranthene			--		
			Beryllium		--			Beryllium	kidney	9.9E-005	--	1.4E-001	1.4E-001
			bis(2-Ethylhexyl)phthalate	1.2E-007	--	1.7E-006	1.8E-006	bis(2-Ethylhexyl)phthalate	liver	5.9E-002	--	8.4E-001	9.0E-001
			Butylbenzylphthalate		--			Butylbenzylphthalate	mammary	4.3E-005	--	6.2E-004	6.7E-004
			Cadmium		--			Cadmium	kidney	2.2E-001	--	1.3E+002	1.3E+002
			Chlorobenzene		--			Chlorobenzene	liver	6.6E-003	--	3.1E-001	3.1E-001
			Chloroform	5.7E-014	--	8.6E-013	9.2E-013	Chloroform	circulatory	1.3E-007	--	2.0E-006	2.1E-006
			Chromium 3+		--			Chromium 3+	liver	3.3E-004	--	1.2E+000	1.2E+000
			Chrysene	1.1E-011	--	3.9E-010	4.0E-010	Chrysene	liver		--		
			cis-1,2-Dichloroethene		--			cis-1,2-Dichloroethene	circulatory	2.9E-007	--	4.2E-006	4.5E-006
			Cobalt		--			Cobalt	heart	3.2E-004	--	4.7E-003	5.0E-003
			Copper		--			Copper	liver	1.9E-002	--	4.6E-001	4.8E-001
			Cyanide (total)		--			Cyanide (total)	liver	4.4E-004	--	1.3E-002	1.3E-002
			Dibenzofuran		--			Dibenzofuran	dec growth rate	2.1E-005	--	3.0E-004	3.2E-004
			Dibenzo(a,h)anthracene	1.9E-009	--	3.0E-008	3.1E-008	Dibenzo(a,h)anthracene			--		
			Diethylphthalate		--			Diethylphthalate	low body wt	8.2E-007	--	1.2E-005	1.3E-005
			Dimethylphthalate		--			Dimethylphthalate	GI tract	2.1E-007	--	3.0E-006	3.2E-006
			Di-n-butylphthalate		--			Di-n-butylphthalate	liver	3.2E-004	--	4.7E-003	5.0E-003
			Di-n-octylphthalate		--			Di-n-octylphthalate		2.5E-004	--	3.6E-003	3.8E-003
			Ethyl Benzene		--			Ethyl Benzene	liver	3.0E-002	--	4.7E-001	5.0E-001
			Fluoranthene		--			Fluoranthene	kidney	2.0E-005	--	2.9E-004	3.1E-004
			Fluorene		--			Fluorene	skeletal	3.2E-006	--	4.6E-005	5.0E-005
			Indeno(1,2,3-cd)pyrene	5.6E-010	--	8.1E-009	8.7E-009	Indeno(1,2,3-cd)pyrene			--		
			Iron		--			Iron		3.1E-002	--	4.4E-001	4.7E-001
			Isophorone	3.2E-009	--	4.6E-008	4.9E-008	Isophorone	kidney	2.4E-003	--	3.4E-002	3.6E-002
			Lead		--			Lead	CNS		--		
			Manganese		--			Manganese	kidney	1.0E-002	--	1.5E-001	1.6E-001

Scenario Timeframe: Future  
 Receptor Population: Trespasser  
 Receptor Age: Adolescent

Table 6-3-10  
 Summary of Receptor Risks and Hazards For COPCs  
 Central Tendency  
 American Chemical Services Site

File: Area3C1\_v0411T\_sum\_Ta3CT.wk4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Mercury		--			Mercury	low body wt		--		
			Methylene Chloride	1.9E-011	--	5.0E-010	5.2E-010	Methylene Chloride	liver	5.9E-006	--	1.5E-004	1.6E-004
			m,p-xylene	--	--	--	--	m,p-xylene	fetotoxic	7.9E-006	--	1.3E-004	1.3E-004
			Naphthalene	--	--	--	--	Naphthalene	circulatory	4.5E-003	--	6.4E-002	6.9E-002
			Nickel	--	--	--	--	Nickel	low body wt	1.3E-003	--	3.7E-001	3.7E-001
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	fetotoxic	4.4E-006	--	7.0E-005	7.5E-005
			Pentachlorophenol	1.8E-009	--	2.6E-008	2.8E-008	Pentachlorophenol	liver	7.0E-005	--	1.0E-003	1.1E-003
			Phenol	--	--	--	--	Phenol	liver	1.9E-004	--	2.7E-003	2.9E-003
			Pyrene	--	--	--	--	Pyrene	liver	1.8E-005	--	2.7E-004	2.8E-004
			Selenium	--	--	--	--	Selenium	liver	4.1E-003	--	5.9E-002	6.4E-002
			Silver	--	--	--	--	Silver	skin	8.2E-003	--	5.6E-001	5.7E-001
			Styrene	--	--	--	--	Styrene	liver	2.0E-004	--	2.9E-003	3.1E-003
			Tetrachloroethene	2.2E-006	--	3.2E-005	3.5E-005	Tetrachloroethene	liver	6.0E-001	--	8.7E+000	9.3E+000
			Thallium	--	--	--	--	Thallium	--	2.8E-003	--	4.1E-002	4.3E-002
			Toluene	--	--	--	--	Toluene	liver	8.5E-002	--	1.2E+000	1.3E+000
			Trichloroethene	2.0E-007	--	2.9E-006	3.1E-006	Trichloroethene	liver	4.2E-001	--	6.1E+000	6.5E+000
			Vanadium	--	--	--	--	Vanadium	circulatory	9.0E-004	--	1.3E-002	1.4E-002
			Xylenes (total)	--	--	--	--	Xylenes (total)	fetotoxic	6.6E-003	--	1.1E-001	1.1E-001
			Zinc	--	--	--	--	Zinc	thyroid	6.9E-003	--	3.3E-001	3.4E-001
			(total)	3.6E-006	--	5.2E-005	5.5E-005	(total)	--	2.2E+000	--	2.3E+002	2.3E+002
	AIR	Area 3, Soil (0' to 10')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	1.4E-005	--	1.4E-005
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	1.3E-003	--	1.3E-003
			1,1,2-Trichloroethane	--	8.2E-012	--	8.2E-012	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	1.5E-011	--	1.5E-011	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	2.2E-004	--	2.2E-004
			1,2-Dichloroethane	--	5.1E-010	--	5.1E-010	1,2-Dichloroethane	circulatory	--	5.6E-004	--	5.6E-004
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	9.2E-004	--	9.2E-004
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	1.7E-006	--	1.7E-006
			1,3-Dichlorobenzene	--	--	--	--	1,3-Dichlorobenzene	respiratory	--	2.3E-011	--	2.3E-011
			1,4-Dichlorobenzene	--	1.3E-011	--	1.3E-011	1,4-Dichlorobenzene	liver	--	3.6E-007	--	3.6E-007
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	7.2E-008	--	7.2E-008
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	6.6E-003	--	6.6E-003
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dichlorophenol	--	--	--	--	2,4-Dichlorophenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	--	--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine	--	--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	5.8E-003	--	5.8E-003
			4-Methylphenol	--	--	--	--	4-Methylphenol	--	--	--	--	--
			4-Nitrophenol	--	--	--	--	4-Nitrophenol	--	--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD	--	--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE	--	--	--	--	--
			4,4'-DDT	--	1.7E-015	--	1.7E-015	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene	--	--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene	--	--	--	--	--
			Acetone	--	--	--	--	Acetone	--	--	--	--	--
			Aldrin	--	2.7E-013	--	2.7E-013	Aldrin	--	--	--	--	--
			alpha-BHC	--	5.4E-015	--	5.4E-015	alpha-BHC	--	--	--	--	--
			Anthracene	--	--	--	--	Anthracene	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	--	--	--	--	--
			Aroclor-1242	--	1.0E-012	--	1.0E-012	Aroclor-1242	--	--	--	--	--
			Aroclor-1248	--	8.3E-013	--	8.3E-013	Aroclor-1248	--	--	--	--	--
			Aroclor-1254	--	5.9E-013	--	5.9E-013	Aroclor-1254	--	--	--	--	--
			Aroclor-1260	--	2.0E-012	--	2.0E-012	Aroclor-1260	--	--	--	--	--
			Arsenic	--	2.8E-012	--	2.9E-012	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	5.0E-005	--	5.0E-005

Table 6-3-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Area3CT.mxd; ITT sum; 1a3CT.mxd

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Benzene	--	1.3E-008	--	1.3E-008	Benzene	blood disorders	--	3.7E-002	--	3.7E-002
			Benzoic Acid	--	--	--	--	Benzoic Acid	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	--	8.0E-014	--	8.0E-014	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene	--	--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene	--	--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol	--	--	--	--	--
			Beryllium	--	1.1E-013	--	1.1E-013	Beryllium	respiratory	--	3.2E-007	--	3.2E-007
			beta-BHC	--	3.0E-015	--	3.0E-015	beta-BHC	--	--	--	--	--
			bis(2-Chloroethyl) ether	--	2.8E-009	--	2.8E-009	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	3.8E-013	--	3.8E-013	bis(2-Ethylhexyl)phthalate	--	--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	--	--	--	--	--
			Cadmium	--	4.7E-011	--	4.7E-011	Cadmium	--	--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide	--	--	6.2E-012	--	6.2E-012
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	1.0E-002	--	1.0E-002
			Chloroform	--	1.2E-009	--	1.2E-009	Chloroform	liver	--	2.4E-002	--	2.4E-002
			Chromium 3+	--	--	--	--	Chromium 3+	--	--	--	--	--
			Chromium 6+	--	1.8E-010	--	1.8E-010	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene	--	--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	--	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	--	--	--	--	--
			Copper	--	--	--	--	Copper	--	--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)	--	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	--	--	--	--
			Dibenzo(a,h)anthracene	--	--	--	--	Dibenzo(a,h)anthracene	--	--	--	--	--
			Dieldrin	--	1.4E-015	--	1.4E-015	Dieldrin	--	--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate	--	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	--	--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	--	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	--	--	--	--	--
			Endosulfan I	--	--	--	--	Endosulfan I	--	--	--	--	--
			Endrin	--	--	--	--	Endrin	--	--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone	--	--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	4.5E-004	--	4.5E-004
			Fluoranthene	--	--	--	--	Fluoranthene	--	--	--	--	--
			Fluorene	--	--	--	--	Fluorene	--	--	--	--	--
			gamma-Chlordane	--	1.5E-016	--	1.5E-016	gamma-Chlordane	--	--	3.1E-010	--	3.1E-010
			Heptachlor	--	1.6E-015	--	1.6E-015	Heptachlor	--	--	--	--	--
			Heptachlor epoxide	--	1.5E-015	--	1.5E-015	Heptachlor epoxide	--	--	--	--	--
			Hexachlorobenzene	--	4.3E-018	--	4.3E-018	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	3.0E-015	--	3.0E-015	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Isophorone	--	--	--	--	Isophorone	--	--	--	--	--
			Lead	--	--	--	--	Lead	--	--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	1.7E-004	--	1.7E-004
			Mercury	--	--	--	--	Mercury	CNS	--	3.6E-007	--	3.6E-007
			Methylene Chloride	--	2.1E-010	--	2.1E-010	Methylene Chloride	respiratory	--	2.0E-005	--	2.0E-005
			m,p-xylene	--	--	--	--	m,p-xylene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	circulatory	--	8.9E-003	--	8.9E-003
			Nickel	--	--	--	--	Nickel	respiratory	--	--	--	--
			N-Nitrosodiphenylamine	--	--	--	--	N-Nitrosodiphenylamine	--	--	--	--	--
			ortho-xylene	--	--	--	--	ortho-xylene	--	--	--	--	--
			Pentachlorophenol	--	--	--	--	Pentachlorophenol	--	--	--	--	--
			Phenanthrene	--	--	--	--	Phenanthrene	--	--	--	--	--
			Phenol	--	--	--	--	Phenol	--	--	--	--	--
			Phthalic anhydride	--	--	--	--	Phthalic anhydride	--	--	--	--	--
			Pyrene	--	--	--	--	Pyrene	--	--	--	--	--
			Selenium	--	--	--	--	Selenium	--	--	--	--	--
			Silver	--	--	--	--	Silver	--	--	--	--	--

Table 6-3-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: Acc30CT, wk4, LT, gsm, Ta30CT, wk4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Styrene	--		--		Styrene	CNS	--	1.2E-004	--	1.2E-004
			Tetrachloroethene	--	3.2E-009	--	3.2E-009	Tetrachloroethene	liver	--	1.6E-003	--	1.6E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	5.6E-003	--	5.6E-003
			Trichloroethene	--	3.0E-008	--	3.0E-008	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	1.1E-010	--	1.1E-010	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		5.1E-008		5.1E-008	(total)			1.0E-001		1.0E-001
			Total Risk Across Subsurface Soil				5.6E-005	Total Hazard Index Across Subsurface Soil					2.3E+002
			Total Risk Across All Media and All Exposure Routes				Reserved						

Total Kidney HI:	1.3E+002
Total Skin HI:	7.3E+001
Total Thyroid HI:	3.4E+001
Total Liver HI:	2.8E+001
Total Circulatory System HI:	3.5E+001
Total CNS HI:	1.9E+002
Total Fetotoxic HI:	9.8E+001
Total GI Tract HI:	2.1E+002
Total Respiratory HI:	1.4E+002
Total Eyes HI:	2.4E+005
Total Reproductive HI:	0.0E+000
Total Mammary HI:	6.7E+004
Total Adrenal HI:	0.0E+000
Total Heart HI:	5.0E+003
Total Skeletal System HI:	5.0E+005
Total Thyroid HI:	3.4E+001
Total Blood Disorders HI:	1.1E+000

Table 6-4-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File TRS4aRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Wetlands Area 4A	2,2'-oxybis(1-Chloropropane)	2.5E-009		1.1E-008	1.4E-008	2,2'-oxybis(1-Chloropropane)	low body weight	1.1E-005		4.7E-005	5.8E-005
			2-Butanone					2-Butanone	liver	3.5E-008		1.6E-007	2.0E-007
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	9.6E-006		4.2E-005	5.2E-005
			4-Methylphenol					4-Methylphenol	respiratory system	1.1E-005		7.4E-005	8.6E-005
			Acetone					Acetone	fetotoxic	1.0E-006		5.6E-006	6.6E-006
			Aluminum					Aluminum	circulatory system	5.1E-003		2.3E-003	7.4E-003
			Anthracene					Anthracene	GI tract	4.6E-007		2.0E-006	2.5E-006
			Antimony					Antimony	skin	3.6E-003		1.6E-001	1.6E-001
			Aroclor-1248	3.4E-007			3.4E-007	Aroclor-1248	liver				
			Aroclor-1254	8.2E-007		5.5E-006	6.4E-006	Aroclor-1254	liver	2.5E-001		1.7E+000	1.9E+000
			Aroclor-1260	2.8E-007		1.3E-006	1.5E-006	Aroclor-1260	circulatory system				
			Arsenic	7.7E-007		1.2E-006	1.9E-006	Arsenic	circulatory system	2.1E-002		3.0E-002	5.1E-002
			Barium					Barium		5.8E-004		2.6E-004	8.3E-004
			Benzene	1.3E-010		6.5E-010	7.9E-010	Benzene	blood disorders	1.9E-005		9.1E-005	1.1E-004
			Benzo(a)anthracene	1.7E-008		7.6E-008	9.3E-008	Benzo(a)anthracene					
			Benzo(a)pyrene	1.8E-007		1.2E-006	1.4E-006	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.3E-008		1.0E-007	1.2E-007	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	2.1E-009		9.3E-009	1.1E-008	Benzo(k)fluoranthene					
			Benzoic Acid					Benzoic Acid	GI tract	1.5E-007		6.7E-007	8.2E-007
			Beryllium					Beryllium	kidney	2.5E-004		1.1E-002	1.1E-002
			bis(2-Chloroethyl) ether	2.0E-008		8.8E-008	1.1E-007	bis(2-Chloroethyl) ether	reproductive system				
			bis(2-Ethylhexyl)phthalate	6.3E-010		2.8E-009	3.4E-009	bis(2-Ethylhexyl)phthalate	liver	2.7E-005		1.2E-004	1.5E-004
			Cadmium					Cadmium	kidney	5.6E-003		9.8E-002	1.0E-001
			Chloroethane	4.2E-012		1.8E-011	2.3E-011	Chloroethane	liver	4.3E-008		1.9E-007	2.3E-007
			Chloroform	5.2E-013		2.4E-012	2.9E-012	Chloroform	circulatory system	1.0E-007		4.7E-007	5.7E-007
			Chromium (total)					Chromium (total)		7.8E-003		3.5E-002	4.2E-002
			Chrysene	1.9E-010		2.0E-009	2.2E-009	Chrysene	liver				
			Copper					Copper	liver	9.4E-004		6.9E-004	1.6E-003
			Di-n-butylphthalate					Di-n-butylphthalate	liver	2.8E-006		1.3E-005	1.6E-005
			Dibenzo(a,h)anthracene	1.1E-007		5.5E-007	6.6E-007	Dibenzo(a,h)anthracene					
			Fluoranthene					Fluoranthene	kidney	7.6E-006		3.3E-005	4.1E-005
			Indeno(1,2,3-cd)pyrene	1.5E-008		6.6E-008	8.1E-008	Indeno(1,2,3-cd)pyrene					
			Iron					Iron		3.5E-002		1.5E-002	5.0E-002
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	1.0E-002		4.5E-003	1.5E-002
			Mercury					Mercury	low body weight				
			Methylene Chloride	1.2E-011		9.6E-011	1.1E-010	Methylene Chloride	liver	3.1E-007		2.5E-006	2.8E-006
			Naphthalene					Naphthalene	circulatory system	1.1E-005		4.7E-005	5.8E-005
			Nickel					Nickel	low body weight	6.8E-004		6.0E-003	6.7E-003
			Pyrene					Pyrene	liver	1.0E-005		4.5E-005	5.5E-005
			Selenium					Selenium	liver	1.1E-004		4.9E-005	1.6E-004
			Thallium					Thallium		1.0E-002		4.5E-003	1.5E-002
			Toluene					Toluene	liver	1.2E-007		5.2E-007	6.4E-007
			Vanadium					Vanadium	circulatory system	3.5E-003		1.5E-003	5.0E-003
			Zinc					Zinc	thyroid	4.5E-004		6.6E-004	1.1E-003
(Total)				2.6E-006		1.0E-005	1.3E-005	(Total)		3.5E-001		2.0E+000	2.4E+000
				Total Risk Across Sediment								Total Hazard Index Across Sediment	
												2.4E+000	

Total Respiratory System HI =	8.6E-005
Total Circulatory System HI =	6.3E-002
Total Low Body Weight HI =	6.7E-003
Total Fetotoxic HI =	6.6E-006
Total GI Tract HI =	5.5E-005
Total Thyroid HI =	1.1E-003
Total Kidney HI =	1.3E-001
Total Liver HI =	1.9E+000
Total Skin HI =	1.6E-001
Total Blood Disorders HI =	1.1E-004

Table 6-4-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population	Trespasser
Receptor Age	Adolescent

File: TRS4aCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Wetland Area 4A	2,2'-oxybis(1-Chloropropane)	5.6E-011		8.1E-011	1.4E-010	2,2'-oxybis(1-Chloropropane)	low body weight	2.8E-006		4.0E-006	6.8E-006
			2-Butanone					2-Butanone	liver	9.1E-009		1.4E-008	2.3E-008
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	2.5E-006		3.6E-006	6.1E-006
			4-Methylphenol					4-Methylphenol	respiratory system	2.9E-006		6.3E-006	9.2E-006
			Acetone					Acetone	fetotoxic	2.6E-007		4.7E-007	7.3E-007
			Aluminum					Aluminum	circulatory system	1.3E-003		1.9E-004	1.5E-003
			Anthracene					Anthracene	GI tract	1.2E-007		1.7E-007	2.9E-007
			Antimony					Antimony	skin	9.2E-004		1.3E-002	1.4E-002
			Aroclor-1248	7.5E-009			7.5E-009	Aroclor-1248	liver				
			Aroclor-1254	1.8E-008		4.0E-008	5.8E-008	Aroclor-1254	liver	6.3E-002		1.4E-001	2.1E-001
			Aroclor-1260	6.3E-009		9.1E-009	1.5E-008	Aroclor-1260	circulatory system				
			Arsenic	1.7E-008		8.4E-009	2.6E-008	Arsenic	circulatory system	5.3E-003		2.5E-003	7.9E-003
			Barium					Barium		1.5E-004		2.2E-005	1.7E-004
			Benzene	3.0E-012		4.8E-012	7.8E-012	Benzene	blood disorders	4.8E-006		7.7E-006	1.3E-005
			Benzo(a)anthracene	3.8E-010		5.5E-010	9.4E-010	Benzo(a)anthracene					
			Benzo(a)pyrene	3.9E-009		8.6E-009	1.2E-008	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.1E-010		7.3E-010	1.2E-009	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	4.7E-011		6.8E-011	1.2E-010	Benzo(k)fluoranthene					
			Benzoic Acid					Benzoic Acid	GI tract	3.9E-008		5.7E-008	9.6E-008
			Beryllium					Beryllium	kidney	6.6E-005		9.4E-004	1.0E-003
			bis(2-Chloroethyl) ether	4.4E-010		6.4E-010	1.1E-009	bis(2-Chloroethyl) ether	reproductive system				
			bis(2-Ethylhexyl)phthalate	1.4E-011		2.0E-011	3.4E-011	bis(2-Ethylhexyl)phthalate	liver	7.0E-006		1.0E-005	1.7E-005
			Cadmium					Cadmium	kidney	1.4E-003		8.3E-003	9.8E-003
			Chloroethane	9.3E-014		1.3E-013	2.3E-013	Chloroethane	liver	1.1E-008		1.6E-008	2.7E-008
			Chloroform	1.1E-014		1.7E-014	2.9E-014	Chloroform	circulatory system	2.6E-008		3.9E-008	6.6E-008
			Chromium (total)					Chromium (total)		2.0E-003		2.9E-003	4.9E-003
			Chrysene	4.1E-012		1.5E-011	1.9E-011	Chrysene	liver				
			Copper					Copper	liver	2.4E-004		5.8E-005	3.0E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	7.4E-007		1.1E-006	1.8E-006
			Dibenzo(a,h)anthracene	2.5E-009		4.0E-009	6.5E-009	Dibenzo(a,h)anthracene					
			Fluoranthene					Fluoranthene	kidney	2.0E-006		2.8E-006	4.8E-006
			Indeno(1,2,3-cd)pyrene	3.3E-010		4.8E-010	8.1E-010	Indeno(1,2,3-cd)pyrene					
			Iron					Iron		9.2E-003		1.3E-003	1.1E-002
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	2.6E-003		3.8E-004	3.0E-003
			Mercury					Mercury	low body weight				
			Methylene Chloride	2.6E-013		7.0E-013	9.6E-013	Methylene Chloride	liver	8.1E-008		2.1E-007	2.9E-007
			Naphthalene					Naphthalene	circulatory system	2.8E-006		4.0E-006	6.7E-006
			Nickel					Nickel	low body weight	1.8E-004		5.1E-004	6.8E-004
			Pyrene					Pyrene	liver	2.6E-006		3.8E-006	6.4E-006
			Selenium					Selenium	liver	2.9E-005		4.2E-006	3.3E-005
			Thallium					Thallium		2.6E-003		3.8E-004	3.0E-003
			Toluene					Toluene	liver	3.1E-008		4.4E-008	7.5E-008
			Vanadium					Vanadium	circulatory system	9.0E-004		1.3E-004	1.0E-003
			Zinc					Zinc	thyroid	1.2E-004		5.6E-005	1.7E-004
			(Total)	5.7E-008		7.3E-008	1.3E-007	(Total)		9.1E-002		1.7E-001	2.6E-001
Total Risk Across Sediment				1.3E-007		Total Hazard Index Across Sediment				2.6E-001			

Total Respiratory System HI =	9.2E-006
Total Circulatory System HI =	1.0E-002
Total Low Body Weight HI =	6.9E-004
Total Fetotoxic HI =	7.3E-007
Total GI Tract HI =	6.9E-006
Total Thyroid HI =	1.7E-004
Total Kidney HI =	1.4E-002
Total Liver HI =	2.1E-001
Total Skin HI =	1.4E-002
Total Blood Disorders HI =	1.3E-005

TABLE 6-4-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRES4A.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Water	Surface Water	Wetlands Area 4A	2,2'-oxybis(1-Chloropropane)	2.2E-008			2.2E-008	2,2'-oxybis(1-Chloropropane)	low body weight	9.3E-005			9.3E-005
			2-Butanone					2-Butanone	liver	2.6E-007		7.6E-008	3.4E-007
			4-Methylphenol					4-Methylphenol	respiratory system	4.5E-005			8.8E-005
			Acetone					Acetone	fetotoxic	2.9E-005		1.1E-006	3.0E-005
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	2.7E-001		1.2E-002	2.8E-001
			Arsenic	6.5E-008		2.7E-009	6.7E-008	Arsenic	circulatory system	1.7E-003		8.0E-005	1.8E-003
			Barium					Barium	NA	3.8E-004		1.7E-005	4.0E-004
			Benzene	6.9E-007		7.2E-007	1.4E-006	Benzene	blood disorders	9.5E-002		1.2E-001	2.2E-001
			bis(2-Chloroethyl) ether	1.2E-007		1.9E-008	1.4E-007	bis(2-Chloroethyl) ether	reproductive system				
			bis(2-Ethylhexyl)phthalate	1.6E-009		2.1E-008	2.3E-008	bis(2-Ethylhexyl)phthalate	liver	6.8E-005		9.1E-004	9.7E-004
			Cadmium					Cadmium	kidney	1.4E-002		1.2E-002	2.7E-002
			Chloroethane	9.3E-009		4.0E-009	1.3E-008	Chloroethane	liver	9.6E-005		4.1E-005	1.4E-004
			Cyanide (total)					Cyanide (total)	liver	4.5E-005		4.0E-006	4.9E-005
			Iron					Iron		4.9E-002		2.2E-003	5.1E-002
			Isophorone	3.6E-011		1.1E-011	4.7E-011	Isophorone	kidney	2.3E-006		7.0E-007	3.0E-006
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	1.1E-002		4.7E-004	1.1E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	1.1E-004			1.1E-004
			Zinc					Zinc	thyroid	3.3E-004		2.9E-005	3.6E-004
			(Total)	9.1E-007		7.7E-007	1.7E-006	(Total)		4.4E-001		1.5E-001	5.9E-001
	Air		2,2'-oxybis(1-Chloropropane)		1.6E-008		1.6E-008	2,2'-oxybis(1-Chloropropane)	liver				
			2-Butanone					2-Butanone	CNS		4.1E-006		4.1E-006
			4-Methylphenol					4-Methylphenol	NA				
			Acetone					Acetone	respiratory system				
			Ammonia					Ammonia					
			Antimony					Antimony					
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzene		8.3E-007		8.3E-007	Benzene	blood disorders		8.6E-001		8.6E-001
			bis(2-Chloroethyl) ether		7.9E-008		7.9E-008	bis(2-Chloroethyl) ether	liver				
			bis(2-Ethylhexyl)phthalate					bis(2-Ethylhexyl)phthalate	NA				
			Cadmium					Cadmium	respiratory tract				
			Chloroethane					Chloroethane	fetotoxic		1.6E-004		1.6E-004
			Cyanide (total)					Cyanide (total)					
			Iron					Iron					
			Isophorone					Isophorone	NA				
			Lead					Lead					
			Manganese					Manganese	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Zinc					Zinc					
			(Total)		9.2E-007		9.2E-007	(Total)			8.6E-001		8.6E-001
Total Risk Across Surface Water				2.6E-006				Total Hazard Index Across Surface Water					1.5E+000

Total Circulatory System HI =	1.7E-003
Total Respiratory System HI =	4.5E-005
Total Fetotoxic HI =	1.6E-004
Total Thyroid HI =	3.3E-004
Total Kidney HI =	2.5E-002
Total Liver HI =	2.1E-004
Total Skin HI =	2.7E-001
Total CNS HI =	4.1E-006
Total Blood Disorders HI =	1.1E+000



TABLE 6.4.4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
CENTRAL TENOENCY  
American Chemical Services NPL Site

Scenario Timeframe: Current/Future  
Receptor Population: Trespasser  
Receptor Age: Adolescent

File: TRES4Act.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
Water	Surface Water	Wetlands Area 4A	2,2'-oxybis(1-Chloropropane)	5.4E-010			5.4E-010	2,2'-oxybis(1-Chloropropane)	low body weight	2.7E-005			2.7E-005	
			2-Butanone					2-Butanone	liver	1.6E-006		7.5E-007	2.4E-006	
			4-Methylphenol					4-Methylphenol	respiratory system	6.6E-005		1.0E-004	1.7E-004	
			Acetone					Acetone	fetotoxic	1.0E-005		5.1E-007	1.1E-005	
			Ammonia					Ammonia	kidney					
			Antimony					Antimony	skin	7.9E-002		5.7E-003	8.5E-002	
			Arsenic	1.6E-009		1.1E-010	1.7E-009	Arsenic	circulatory system	5.0E-004		3.8E-005	5.4E-004	
			Barium					Barium	NA	1.1E-004		8.0E-006	1.2E-004	
			Benzene	2.3E-008		3.9E-008	6.3E-008	Benzene	blood disorders	3.7E-002		7.8E-002	1.2E-001	
			bis(2-Chloroethyl) ether	3.2E-009		7.9E-010	3.9E-009	bis(2-Chloroethyl) ether	reproductive system					
			bis(2-Ethylhexyl)phthalate	3.8E-011		7.4E-009	7.5E-009	bis(2-Ethylhexyl)phthalate	liver	1.9E-005		3.7E-003	3.7E-003	
			Cadmium					Cadmium	kidney	4.1E-003		6.0E-003	1.0E-002	
			Chloroethane	2.7E-010		1.9E-010	4.7E-010	Chloroethane	liver	3.3E-005		2.3E-005	5.6E-005	
			Cyanide (total)					Cyanide (total)	liver	1.2E-005		1.7E-006	1.3E-005	
			Iron					Iron	kidney	1.6E-002		1.2E-003	1.8E-002	
			Isophorone	2.2E-012		1.1E-012	3.4E-012	Isophorone	kidney	1.6E-006		8.4E-007	2.5E-006	
			Lead					Lead	CNS					
			Manganese					Manganese	kidney	3.1E-003		2.2E-004	3.3E-003	
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	3.3E-005			3.3E-005	
			Zinc					Zinc	thyroid	1.0E-004		4.4E-006	1.1E-004	
(Total)				2.9E-008		4.8E-008	7.7E-008	(Total)	1.4E-001		9.5E-002	2.4E-001		
	Air		2,2'-oxybis(1-Chloropropane)		5.8E-010		5.8E-010	2,2'-oxybis(1-Chloropropane)	liver					
			2-Butanone					2-Butanone	CNS			2.4E-006		2.4E-006
			4-Methylphenol					4-Methylphenol	NA					
			Acetone					Acetone	respiratory system					
			Ammonia					Ammonia						
			Antimony					Antimony						
			Arsenic					Arsenic	respiratory tract					
			Barium					Barium	fetotoxic					
			Benzene		3.0E-008		3.0E-008	Benzene	blood disorders		5.0E-001			5.0E-001
			bis(2-Chloroethyl) ether		2.9E-009		2.9E-009	bis(2-Chloroethyl) ether	liver					
			bis(2-Ethylhexyl)phthalate					bis(2-Ethylhexyl)phthalate	NA					
			Cadmium					Cadmium	respiratory tract					
			Chloroethane					Chloroethane	fetotoxic		9.1E-005			9.1E-005
			Cyanide (total)					Cyanide (total)						
			Iron					Iron						
			Isophorone					Isophorone	NA					
			Lead					Lead						
			Manganese					Manganese	respiratory tract					
			Nitrate/Nitrite					Nitrate/Nitrite						
			Zinc					Zinc						
(Total)					3.3E-008		3.3E-008	(Total)			5.0E-001		5.0E-001	
				Total Risk Across Surface Water				Total Hazard Index Across Surface Water						
				1.1E-007				7.4E-001						

Total Circulatory System HI = 5.0E-004  
Total Respiratory System HI = 6.6E-005  
Total Fetotoxic HI = 9.1E-005  
Total Thyroid HI = 1.0E-004  
Total Kidney HI = 2.4E-002  
Total Liver HI = 6.5E-005  
Total Skin HI = 7.9E-002  
Total CNS HI = 2.4E-006  
Total Blood Disorders HI = 6.2E-001

Table 6-5-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: UT48RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	1.5E-006		7.6E-006	9.1E-006
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	1.7E-006		8.8E-006	1.1E-005
			4,4'-DDD	7.6E-009		3.8E-008	4.6E-008	4,4'-DDD	liver				
			4,4'-DDE	4.0E-008		2.0E-007	2.4E-007	4,4'-DDE	liver				
			4,4'-DDT	3.3E-008		5.0E-008	8.3E-008	4,4'-DDT	fetotoxic	5.4E-004		8.2E-004	1.4E-003
			Acetone					Acetone	fetotoxic	2.8E-007		1.8E-006	2.1E-006
			alpha-Chlordane	3.1E-008		6.3E-008	9.4E-008	alpha-Chlordane	liver	5.0E-004		1.0E-003	1.5E-003
			Anthracene					Anthracene	GI tract	9.6E-007		4.8E-006	5.8E-006
			Aroclor-1248	1.8E-007		8.9E-007	1.1E-006	Aroclor-1248	liver				
			Aroclor-1254	7.1E-006		5.6E-005	6.3E-005	Aroclor-1254	liver	5.0E-001		3.9E+000	4.4E+000
			Aroclor-1260	7.8E-007		3.9E-006	4.7E-006	Aroclor-1260	circulatory system				
			Arsenic	4.6E-006		7.3E-006	1.2E-005	Arsenic	circulatory system	2.9E-002		4.5E-002	7.4E-002
			Benzo(a)anthracene	1.1E-007		5.3E-007	6.4E-007	Benzo(a)anthracene					
			Benzo(a)pyrene	1.2E-006		9.1E-006	1.0E-005	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.3E-007		6.5E-007	7.8E-007	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	1.2E-008		6.1E-008	7.3E-008	Benzo(k)fluoranthene					
			beta-BHC	1.9E-008		9.5E-009	2.8E-008	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	2.3E-008		1.1E-007	1.4E-007	bis(2-Ethylhexyl)phthalate	liver	2.3E-004		1.1E-003	1.4E-003
			Cadmium					Cadmium	kidney	1.3E-002		1.3E+000	1.4E+000
			Carbazole	2.9E-010		1.5E-009	1.8E-009	Carbazole					
			Chromium (total)					Chromium (total)		1.2E-002		6.2E-002	7.5E-002
			Chrysene	1.1E-009		1.4E-008	1.5E-008	Chrysene	liver				
			Copper					Copper	liver	1.0E-003		8.7E-004	1.9E-003
			Di-n-butylphthalate					Di-n-butylphthalate	liver	9.5E-007		4.9E-006	5.9E-006
			Dibenzo(a,h)anthracene	8.5E-007		4.8E-006	5.6E-006	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	7.3E-005		3.7E-004	4.4E-004
			Endrin					Endrin	liver	5.6E-004		2.8E-003	3.4E-003
			Fluoranthene					Fluoranthene	kidney	1.1E-005		5.6E-005	6.7E-005
			gamma-BHC	1.5E-008		7.7E-008	9.2E-008	gamma-BHC	liver	1.1E-004		5.5E-004	6.6E-004
			gamma-Chlordane	6.8E-009		1.4E-008	2.0E-008	gamma-Chlordane	liver	1.1E-004		2.2E-004	3.3E-004
			Heptachlor	1.1E-007		5.7E-007	6.8E-007	Heptachlor	liver	1.4E-004		7.0E-004	8.4E-004
			Indeno(1,2,3-cd)pyrene	1.0E-007		5.0E-007	6.0E-007	Indeno(1,2,3-cd)pyrene					
			Isophorone	1.6E-011		8.1E-011	9.7E-011	Isophorone	kidney	2.4E-007		1.2E-006	1.4E-006
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				

Table 6-5-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: UT14BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Methoxychlor					Methoxychlor	reproductive system	6.5E-005		3.3E-004	3.9E-004
			Naphthalene					Naphthalene	circulatory system	1.4E-006		7.1E-006	8.5E-006
			Pyrene					Pyrene	liver	1.4E-005		7.3E-005	8.7E-005
			Zinc					Zinc	thyroid	1.1E-003		1.9E-003	3.0E-003
			(Total)	1.5E-005		8.5E-005	1.0E-004	(Total)		5.5E-001		5.4E+000	5.9E+000
Total Risk Across Sediments				1.0E-004				Total Hazard Index Across All Exposure Routes					5.9E+000

Total Reproductive System HI =	3.9E-004
Total Circulatory System HI =	7.4E-002
Total Fetotoxic HI =	1.4E-003
Total GI Tract HI =	1.6E-005
Total Thyroid HI =	3.0E-003
Total Kidney HI =	1.4E+000
Total Liver HI =	4.4E+000

Table 6-5-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Utility Worker  
Receptor Age: Adult

File: UTI4BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	5.8E-007		1.1E-006	1.7E-006
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	6.8E-007		1.3E-006	2.0E-006
			4,4'-DDD	5.9E-010		1.1E-009	1.7E-009	4,4'-DDD	liver				
			4,4'-DDE	3.1E-009		6.0E-009	9.1E-009	4,4'-DDE	liver				
			4,4'-DDT	2.6E-009		1.5E-009	4.1E-009	4,4'-DDT	fetotoxic	2.1E-004		1.2E-004	3.3E-004
			Acetone					Acetone	fetotoxic	1.1E-007		2.7E-007	3.8E-007
			alpha-Chlordane	2.4E-009		1.9E-009	4.3E-009	alpha-Chlordane	liver	1.9E-004		1.5E-004	3.4E-004
			Anthracene					Anthracene	GI tract	3.7E-007		7.3E-007	1.1E-006
			Aroclor-1248	1.4E-008		2.7E-008	4.1E-008	Aroclor-1248	liver				
			Aroclor-1254	5.5E-007		1.7E-006	2.2E-006	Aroclor-1254	liver	1.9E-001		5.9E-001	7.9E-001
			Aroclor-1260	6.1E-008		1.2E-007	1.8E-007	Aroclor-1260	circulatory system				
			Arsenic	3.8E-007		2.2E-007	5.8E-007	Arsenic	circulatory system	1.1E-002		6.9E-003	1.8E-002
			Benzo(a)anthracene	8.2E-009		1.6E-008	2.4E-008	Benzo(a)anthracene					
			Benzo(a)pyrene	9.1E-008		2.7E-007	3.6E-007	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.0E-008		2.0E-008	3.0E-008	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	9.4E-010		1.8E-009	2.8E-009	Benzo(k)fluoranthene					
			beta-BHC	1.5E-009		2.9E-010	1.8E-009	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	1.8E-009		3.4E-009	5.2E-009	bis(2-Ethylhexyl)phthalate	liver	8.8E-005		1.7E-004	2.6E-004
			Cadmium					Cadmium	kidney	5.2E-003		2.0E-001	2.1E-001
			Carbazole	2.3E-011		4.4E-011	6.7E-011	Carbazole					
			Chromium (total)					Chromium (total)		4.8E-003		9.4E-003	1.4E-002
			Chrysene	8.9E-011		4.3E-010	5.1E-010	Chrysene	liver				
			Copper					Copper	liver	4.1E-004		1.3E-004	5.4E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	3.7E-007		7.4E-007	1.1E-006
			Dibenzo(a,h)anthracene	6.6E-008		1.4E-007	2.1E-007	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	2.8E-005		5.6E-005	8.4E-005
			Endrin					Endrin	liver	2.2E-004		4.3E-004	6.5E-004
			Fluoranthene					Fluoranthene	kidney	4.3E-006		8.5E-006	1.3E-005
			gamma-BHC	1.2E-009		2.3E-009	3.5E-009	gamma-BHC	liver	4.2E-005		8.3E-005	1.3E-004
			gamma-Chlordane	5.3E-010		4.1E-010	9.4E-010	gamma-Chlordane	liver	4.2E-005		3.3E-005	7.5E-005
			Heptachlor	8.7E-009		1.7E-008	2.6E-008	Heptachlor	liver	5.4E-005		1.1E-004	1.6E-004
			Indeno(1,2,3-cd)pyrene	7.8E-009		1.5E-008	2.3E-008	Indeno(1,2,3-cd)pyrene					
			Isophorone	1.2E-012		2.4E-012	3.7E-012	Isophorone	kidney	9.2E-008		1.8E-007	2.7E-007
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				

Table 6-5-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: UT148CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Methoxychlor					Methoxychlor	reproductive system	2.5E-005		5.0E-005	7.5E-005
			Naphthalene					Naphthalene	circulatory system	5.5E-007		1.1E-006	1.6E-006
			Pyrene					Pyrene	liver	5.6E-008		1.1E-005	1.7E-005
			Zinc					Zinc	thyroid	4.4E-004		2.8E-004	7.2E-004
			(Total)	1.2E-006		2.6E-006	3.8E-006	(Total)		2.2E-001		8.1E-001	1.0E+000
Total Risk Across Sediments				3.8E-006				Total Hazard Index Across All Exposure Routes					1.0E+000

Total Reproductive System HI =	7.5E-005
Total Circulatory System HI =	1.8E-002
Total Fetotoxic HI =	3.3E-004
Total GI Tract HI =	3.1E-006
Total Thyroid HI =	7.2E-004
Total Kidney HI =	2.1E-001
Total Liver HI =	7.9E-001

TABLE 6-5-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\lacs\sktbls\UG4BFWRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Excavation Area 4B	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system			2.63E-004	2.63E-004
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS			1.64E-002	1.64E-002
			1,2-Dichloroethane			1.70E-007	1.70E-007	1,2-Dichloroethane	fetotoxic			1.74E-004	1.74E-004
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney			2.18E-003	2.18E-003
			1,4-Dichlorobenzene			7.54E-007	7.54E-007	1,4-Dichlorobenzene	GI tract			2.93E-003	2.93E-003
			2,2'-oxybis(1-Chloropropane)			1.82E-005	1.82E-005	2,2'-oxybis(1-Chloropropane)	low body wt			1.82E-002	1.82E-002
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized			4.15E-002	4.15E-002
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory			1.19E-001	1.19E-001
			Aluminum					Aluminum	circulatory system			7.26E-004	7.26E-004
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin			2.27E-001	2.27E-001
			Arochlor-1248			2.84E-003	2.84E-003	Arochlor-1248	liver				
			Arsenic			1.17E-005	1.17E-005	Arsenic	circulatory system			7.28E-002	7.28E-002
			Barium					Barium	NA			3.37E-003	3.37E-003
			Benzene			1.16E-002	1.16E-002	Benzene	blood disorders			3.72E+002	3.72E+002
			Beryllium					Beryllium	kidney			5.55E-001	5.55E-001
			bis(2-Chloroethyl)Ether			6.96E-005	6.96E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			1.13E-005	1.13E-005	bis(2-Ethylhexyl)Phthalate	liver			1.13E-001	1.13E-001
			Cadmium (water)					Cadmium (water)	kidney			5.63E-002	5.63E-002
			Chloroethane			7.52E-006	7.52E-006	Chloroethane	liver			1.82E-002	1.82E-002
			Chloromethane			6.29E-007	6.29E-007	Chloromethane	kidney				
			Chromium (VI)			5.55E-010	5.55E-010	Chromium (VI)				1.73E-002	1.73E-002
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system			9.80E-005	9.80E-005
			Cobalt					Cobalt	circulatory system			2.65E-005	2.65E-005
			Copper					Copper	liver			4.12E-004	4.12E-004
			Diethylphthalate					Diethylphthalate	low body wt			3.68E-005	3.68E-005
			Ethylbenzene					Ethylbenzene	liver			2.84E-001	2.84E-001
			Iron					Iron				7.72E-002	7.72E-002
			Isophorone			5.84E-009	5.84E-009	Isophorone	kidney			8.61E-005	8.61E-005
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney			9.65E-002	9.65E-002
			Methylene Chloride			7.46E-007	7.46E-007	Methylene Chloride	liver			4.64E-003	4.64E-003
			Naphthalene					Naphthalene	circulatory system			4.75E-003	4.75E-003
			Nickel					Nickel	low body wt			2.41E-003	2.41E-003

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Nitrate/Nitrite Phenol Thallium Toluene trans-1,2-Dichloroethene Vanadium Vinyl Chloride Xylene (mixed) Zinc (Total)			2.13E-006	2.13E-006	Nitrate/Nitrite Phenol Thallium Toluene trans-1,2-Dichloroethene Vanadium Vinyl Chloride Xylene (mixed) Zinc (Total)	fetotoxic liver NA liver kidney circulatory system liver fetotoxic thyroid			1.08E-003 2.59E-002 2.44E-001 1.05E-004 1.32E-003 6.64E-002 1.54E-003 3.74E+002	1.08E-003 2.59E-002 2.44E-001 1.05E-004 1.32E-003 6.64E-002 1.54E-003 3.74E+002
	Air	Excavation Vapors	1,1-Dichloroethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloroethene(mixture) 1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) 2,4-Dimethylphenol 4-Methylphenol (P-Cresol) Aluminum Ammonia Antimony Arochlor-1248 Arsenic Barium Benzene Beryllium bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chloroethane Chloromethane Chromium (VI) cis-1,2-Dichloroethene Cobalt		7.20E-008  2.22E-008 2.25E-006         1.35E-003	7.20E-008  2.22E-008 2.25E-006         1.35E-003	1,1-Dichloroethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloroethene(mixture) 1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) 2,4-Dimethylphenol 4-Methylphenol (P-Cresol) Aluminum Ammonia Antimony Arochlor-1248 Arsenic Barium Benzene Beryllium bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chloroethane Chloromethane Chromium (VI) cis-1,2-Dichloroethene Cobalt	kidney low body weight circulatory system  liver liver  NA respiratory system respiratory system  NA respiratory tract fetotoxic blood disorders lung liver NA respiratory tract fetotoxic kidney respiratory tract		4.98E-005 5.31E-003 1.58E-003  1.23E-005       7.69E+001  9.44E-004	4.98E-005 5.31E-003 1.58E-003  1.23E-005       7.69E+001  9.44E-004		

TABLE 6-5-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\UG4BFWRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Copper					Copper					
			Diethylphthalate					Diethylphthalate					
			Ethylbenzene					Ethylbenzene	respiratory tract		3.03E-003		3.03E-003
			Iron					Iron					
			Isophorone					Isophorone	NA				
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		5.09E-008		5.09E-008	Methylene Chloride	respiratory tract		1.00E-004		1.00E-004
			Naphthalene					Naphthalene	circulatory system		3.08E-003		3.08E-003
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Thallium					Thallium					
			Toluene					Toluene	CNS		2.43E-002		2.43E-002
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium					
			Vinyl Chloride		1.42E-007		1.42E-007	Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
			Zinc					Zinc					
			(Total)		1.36E-003		1.36E-003	(Total)			7.69E+001		7.69E+001
Total Risk Across Groundwater							1.6E-002	Total Hazard Across Groundwater					4.5E+002
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	8.5E-002
Total Liver HI =	6.7E-001
Total Kidney HI =	7.1E-001
Total Skin HI =	2.3E-001
Total Thyroid HI =	1.5E-003
Total CNS HI =	4.1E-002
Total Respiratory Tract HI =	1.2E-001
Total GI Tract HI =	2.9E-003
Total Blood Disorders HI =	4.5E+002



TABLE 6-5-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acsvrsktbls\UG4BFWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Excavation Area 4B	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system			1.59E-003	1.59E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS			9.91E-002	9.91E-002
			1,2-Dichloroethane			5.62E-010	5.62E-010	1,2-Dichloroethane	fetotoxic			1.05E-003	1.05E-003
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney			1.32E-002	1.32E-002
			1,4-Dichlorobenzene			2.50E-009	2.50E-009	1,4-Dichlorobenzene	GI tract			1.77E-002	1.77E-002
			2,2'-oxybis(1-Chloropropane)			6.02E-008	6.02E-008	2,2'-oxybis(1-Chloropropane)	low body wt			1.10E-001	1.10E-001
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized			2.51E-001	2.51E-001
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory			7.19E-001	7.19E-001
			Aluminum					Aluminum	circulatory system			4.39E-003	4.39E-003
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin			1.37E+000	1.37E+000
			Arochlor-1248			9.41E-006	9.41E-006	Arochlor-1248	liver				
			Arsenic			3.87E-008	3.87E-008	Arsenic	circulatory system			4.40E-001	4.40E-001
			Barium					Barium	NA			2.04E-002	2.04E-002
			Benzene			3.83E-005	3.83E-005	Benzene	blood disorders			2.30E+002	2.30E+002
			Beryllium					Beryllium	kidney			3.35E+000	3.35E+000
			bis(2-Chloroethyl)Ether			2.30E-007	2.30E-007	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			3.76E-008	3.76E-008	bis(2-Ethylhexyl)Phthalate	liver			6.85E-001	6.85E-001
			Cadmium (water)					Cadmium (water)	kidney			3.40E-001	3.40E-001
			Chloroethane			2.49E-008	2.49E-008	Chloroethane	liver			1.10E-001	1.10E-001
			Chloromethane			2.08E-009	2.08E-009	Chloromethane	kidney				
			Chromium (VI)			1.84E-012	1.84E-012	Chromium (VI)				1.04E-001	1.04E-001
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system			5.92E-004	5.92E-004
			Cobalt					Cobalt	circulatory system			1.60E-004	1.60E-004
			Copper					Copper	liver			2.49E-003	2.49E-003
			Diethylphthalate					Diethylphthalate	low body wt			2.22E-004	2.22E-004
			Ethylbenzene					Ethylbenzene	liver			1.72E+000	1.72E+000
			Iron					Iron				4.66E-001	4.66E-001
			Isophorone			1.93E-011	1.93E-011	Isophorone	kidney			5.20E-004	5.20E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney			5.83E-001	5.83E-001
			Methylene Chloride			2.47E-009	2.47E-009	Methylene Chloride	liver			2.80E-002	2.80E-002
			Naphthalene					Naphthalene	circulatory system			2.87E-002	2.87E-002
			Nickel					Nickel	low body wt			1.45E-002	1.45E-002

TABLE 6-5-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\projects\acsr\sktbls\UG4BFWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Nitrate/Nitrite Phenol Thallium Toluene trans-1,2-Dichloroethene Vanadium Vinyl Chloride Xylene (mixed) Zinc (Total)			7.04E-009	7.04E-009	Nitrate/Nitrite Phenol Thallium Toluene trans-1,2-Dichloroethene Vanadium Vinyl Chloride Xylene (mixed) Zinc (Total)	fetotoxic liver NA liver kidney circulatory system liver fetotoxic thyroid			6.52E-003 1.57E-001 1.47E+000 6.34E-004 7.95E-003 4.01E-001 9.33E-003 2.43E+002	6.52E-003 1.57E-001 1.47E+000 6.34E-004 7.95E-003 4.01E-001 9.33E-003 2.43E+002
	Air	Excavation Vapors	1,1-Dichloroethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloroethene(mixture) 1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) 2,4-Dimethylphenol 4-Methylphenol (P-Cresol) Aluminum Ammonia Antimony Arochlor-1248 Arsenic Barium Benzene Beryllium bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chloroethane Chloromethane Chromium (VI) cis-1,2-Dichloroethene Cobalt		1.97E-010    6.08E-011 6.15E-009      3.71E-006		1.97E-010  6.08E-011 6.15E-009      3.71E-006	1,1-Dichloroethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloroethene(mixture) 1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) 2,4-Dimethylphenol 4-Methylphenol (P-Cresol) Aluminum Ammonia Antimony Arochlor-1248 Arsenic Barium Benzene Beryllium bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chloroethane Chloromethane Chromium (VI) cis-1,2-Dichloroethene Cobalt	kidney low body weight circulatory system  liver liver NA respiratory system respiratory system  NA respiratory tract fetotoxic blood disorders lung liver NA respiratory tract fetotoxic kidney respiratory tract		4.98E-005 5.31E-003 1.58E-003  1.23E-005      7.69E+001  9.44E-004	4.98E-005 5.31E-003 1.58E-003  1.23E-005      7.69E+001  9.44E-004	

TABLE 6-5-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Utility Worker
Receptor Age:	Adult

File: c:\project\stacs\rsktbls\UG4BFWCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Copper					Copper					
			Diethylphthalate					Diethylphthalate					
			Ethylbenzene					Ethylbenzene	respiratory tract		3.03E-003		3.03E-003
			Iron					Iron					
			Isophorone					Isophorone	NA				
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		1.39E-010		1.39E-010	Methylene Chloride	respiratory tract		1.00E-004		1.00E-004
			Naphthalene					Naphthalene	circulatory system		3.08E-003		3.08E-003
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Thallium					Thallium					
			Toluene					Toluene	CNS		2.43E-002		2.43E-002
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium					
			Vinyl Chloride		3.89E-010		3.89E-010	Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
			Zinc					Zinc					
			(Total)		3.72E-006		3.72E-006	(Total)			7.69E+001		7.69E+001
Total Risk Across Groundwater							5.2E-005	Total Hazard Across Groundwater					3.2E+002
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	4.9E-001
Total Liver HI =	4.0E+000
Total Kidney HI =	4.3E+000
Total Skin HI =	1.4E+000
Total Thyroid HI =	9.3E-003
Total CNS HI =	1.2E-001
Total Respiratory Tract HI =	7.2E-001
Total GI Tract HI =	1.8E-002
Total Blood Disorders HI =	3.1E+002

Table 6-5-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: IND4BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	1.3E-006		7.6E-006	8.9E-006
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	1.5E-006		8.8E-006	1.0E-005
			4,4'-DDD	6.5E-009		3.8E-008	4.4E-008	4,4'-DDD	liver				
			4,4'-DDE	3.4E-008		2.0E-007	2.3E-007	4,4'-DDE	liver				
			4,4'-DDT	2.9E-008		5.0E-008	7.8E-008	4,4'-DDT	fetotoxic	4.7E-004		8.2E-004	1.3E-003
			Acetone					Acetone	fetotoxic	2.4E-007		1.8E-006	2.0E-006
			alpha-Chlordane	2.7E-008		6.2E-008	8.9E-008	alpha-Chlordane	liver	4.3E-004		1.0E-003	1.4E-003
			Anthracene					Anthracene	GI tract	8.3E-007		4.8E-006	5.7E-006
			Aroclor-1248	1.5E-007		8.9E-007	1.0E-006	Aroclor-1248	liver				
			Aroclor-1254	6.2E-006		5.6E-005	6.2E-005	Aroclor-1254	liver	4.3E-001		3.9E+000	4.4E+000
			Aroclor-1260	6.8E-007		3.9E-006	4.6E-006	Aroclor-1260	circulatory system				
			Arsenic	4.0E-006		7.3E-006	1.1E-005	Arsenic	circulatory system	2.5E-002		4.5E-002	7.0E-002
			Benzo(a)anthracene	9.2E-008		5.3E-007	6.2E-007	Benzo(a)anthracene					
			Benzo(a)pyrene	1.0E-006		9.1E-006	1.0E-005	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.1E-007		6.5E-007	7.6E-007	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	1.0E-008		6.1E-008	7.1E-008	Benzo(k)fluoranthene					
			beta-BHC	1.6E-008		9.5E-009	2.6E-008	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	2.0E-008		1.1E-007	1.3E-007	bis(2-Ethylhexyl)phthalate	liver	2.0E-004		1.1E-003	1.3E-003
			Cadmium					Cadmium	kidney	1.2E-002		1.3E+000	1.4E+000
			Carbazole	2.5E-010		1.5E-009	1.7E-009	Carbazole					
			Chromium (total)					Chromium (total)		1.1E-002		6.2E-002	7.3E-002
			Chrysene	9.9E-010		1.4E-008	1.5E-008	Chrysene	liver				
			Copper					Copper	liver	9.1E-004		8.7E-004	1.8E-003
			Di-n-butylphthalate					Di-n-butylphthalate	liver	8.2E-007		4.9E-006	5.7E-006
			Dibenzo(a,h)anthracene	7.4E-007		4.8E-006	5.5E-006	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	6.4E-005		3.7E-004	4.3E-004
			Endrin					Endrin	liver	4.9E-004		2.8E-003	3.3E-003
			Fluoranthene					Fluoranthene	kidney	9.7E-006		5.6E-005	6.6E-005
			gamma-BHC	1.3E-008		7.6E-008	9.0E-008	gamma-BHC	liver	9.5E-005		5.5E-004	6.4E-004
			gamma-Chlordane	5.9E-009		1.4E-008	1.9E-008	gamma-Chlordane	liver	9.4E-005		2.2E-004	3.1E-004
			Heptachlor	9.7E-008		5.7E-007	6.6E-007	Heptachlor	liver	1.2E-004		7.0E-004	8.3E-004
			Indeno(1,2,3-cd)pyrene	8.7E-008		5.0E-007	5.9E-007	Indeno(1,2,3-cd)pyrene					
			Isophorone	1.4E-011		8.1E-011	9.5E-011	Isophorone	kidney	2.1E-007		1.2E-006	1.4E-006

Table 6-5-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: IND4BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				
			Methoxychlor					Methoxychlor	reproductive system	5.7E-005		3.3E-004	3.9E-004
			Naphthalene					Naphthalene	circulatory system	1.2E-006		7.1E-006	8.3E-006
			Pyrene					Pyrene	liver	1.3E-005		7.3E-005	8.5E-005
			Zinc					Zinc	thyroid	9.8E-004		1.9E-003	2.9E-003
			(Total)	1.3E-005		8.5E-005	9.8E-005	(Total)		4.8E-001		5.4E+000	5.9E+000
Total Risk Across Sediments				9.8E-005				Total Hazard Index Across All Exposure Routes					5.9E+000

Total Reproductive System HI = 3.9E-004  
Total Circulatory System HI = 7.0E-002  
Total Fetotoxic HI = 1.3E-003  
Total GI Tract HI = 1.6E-005  
Total Thyroid HI = 2.9E-003  
Total Kidney HI = 1.4E+000  
Total Liver HI = 4.4E+000

Table 6-5-6  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: IND4BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	5.7E-007		1.1E-006	1.7E-006
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	6.6E-007		1.3E-006	2.0E-006
			4,4'-DDD	5.7E-010		1.1E-009	1.7E-009	4,4'-DDD	liver				
			4,4'-DDE	3.0E-009		6.0E-009	9.1E-009	4,4'-DDE	liver				
			4,4'-DDT	2.5E-009		1.5E-009	4.0E-009	4,4'-DDT	fetotoxic	2.1E-004		1.2E-004	3.3E-004
			Acetone					Acetone	fetotoxic	1.1E-007		2.7E-007	3.8E-007
			alpha-Chlordane	2.4E-009		1.9E-009	4.3E-009	alpha-Chlordane	liver	1.9E-004		1.5E-004	3.4E-004
			Anthracene					Anthracene	GI tract	3.6E-007		7.3E-007	1.1E-006
			Aroclor-1248	1.3E-008		2.7E-008	4.0E-008	Aroclor-1248	liver				
			Aroclor-1254	5.4E-007		1.7E-006	2.2E-006	Aroclor-1254	liver	1.9E-001		5.9E-001	7.8E-001
			Aroclor-1260	6.0E-008		1.2E-007	1.8E-007	Aroclor-1260	circulatory system				
			Arsenic	3.5E-007		2.2E-007	5.7E-007	Arsenic	circulatory system	1.1E-002		6.9E-003	1.8E-002
			Benzo(a)anthracene	8.1E-009		1.6E-008	2.4E-008	Benzo(a)anthracene					
			Benzo(a)pyrene	9.0E-008		2.7E-007	3.6E-007	Benzo(a)pyrene					
			Benzo(b)fluoranthene	9.9E-009		2.0E-008	3.0E-008	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	9.2E-010		1.8E-009	2.8E-009	Benzo(k)fluoranthene					
			beta-BHC	1.4E-009		2.9E-010	1.7E-009	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	1.7E-009		3.4E-009	5.2E-009	bis(2-Ethylhexyl)phthalate	liver	8.6E-005		1.7E-004	2.6E-004
			Cadmium					Cadmium	kidney	5.1E-003		2.0E-001	2.1E-001
			Carbazole	2.2E-011		4.4E-011	6.6E-011	Carbazole					
			Chromium (total)					Chromium (total)		4.7E-003		9.4E-003	1.4E-002
			Chrysene	8.7E-011		4.3E-010	5.1E-010	Chrysene	liver				
			Copper					Copper	liver	4.0E-004		1.3E-004	5.3E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	3.6E-007		7.4E-007	1.1E-006
			Dibenzo(a,h)anthracene	6.5E-008		1.4E-007	2.1E-007	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	2.8E-005		5.6E-005	8.4E-005
			Endrin					Endrin	liver	2.1E-004		4.3E-004	6.4E-004
			Fluoranthene					Fluoranthene	kidney	4.2E-006		8.5E-006	1.3E-005
			gamma-BHC	1.2E-009		2.3E-009	3.5E-009	gamma-BHC	liver	4.1E-005		8.3E-005	1.2E-004
			gamma-Chlordane	5.2E-010		4.1E-010	9.3E-010	gamma-Chlordane	liver	4.1E-005		3.3E-005	7.4E-005
			Heptachlor	8.6E-009		1.7E-008	2.6E-008	Heptachlor	liver	5.3E-005		1.1E-004	1.6E-004
			Indeno(1,2,3-cd)pyrene	7.6E-009		1.5E-008	2.3E-008	Indeno(1,2,3-cd)pyrene					
			Isophorone	1.2E-012		2.4E-012	3.7E-012	Isophorone	kidney	9.0E-008		1.8E-007	2.7E-007
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				
			Methoxychlor					Methoxychlor	reproductive system	2.5E-005		5.0E-005	7.5E-005
			Naphthalene					Naphthalene	circulatory system	5.4E-007		1.1E-006	1.6E-006
			Pyrene					Pyrene	liver	5.5E-006		1.1E-005	1.7E-005
			Zinc					Zinc	thyroid	4.3E-004		2.8E-004	7.1E-004
(Total)				1.2E-006		2.6E-006	3.7E-006	(Total)		2.1E-001		6.1E-001	1.0E+000
				Total Risk Across Sediments								Total Hazard Index Across All Exposure Routes	
				3.7E-006								1.0E+000	

Total Reproductive System HI =	7.5E-005
Total Circulatory System HI =	1.8E-002
Total Fetotoxic HI =	3.3E-004
Total GI Tract HI =	3.1E-006
Total Thyroid HI =	7.1E-004
Total Kidney HI =	2.1E-001
Total Liver HI =	7.8E-001

Table 6-5-7  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Routine Worker  
Receptor Age: Adult

File: fworkr4b.wk4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
Surface Water	Surface Water	Drainage Ditch Area 4B	1,1,1-Trichloroethane					1,1,1-Trichloroethane	liver	7.5E-004		3.1E-003	3.8E-003	
			1,1,2,2-Tetrachloroethane	1.7E-009		6.6E-009	8.3E-009	1,1,2,2-Tetrachloroethane	liver	1.6E-006		6.2E-006	7.8E-006	
			1,1,2-Trichloroethane	1.4E-009		3.6E-009	5.0E-009	1,1,2-Trichloroethane	circulatory system	7.0E-005		1.8E-004	2.5E-004	
			1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	2.3E-004		4.0E-004	6.2E-004	
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene		6.0E-005		2.2E-003	2.3E-003	
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	nervous system	7.3E-006		1.2E-004	1.3E-004	
			1,2-Dichloroethane	4.6E-009		4.8E-009	9.4E-009	1,2-Dichloroethane	fetotoxic	1.9E-005		2.0E-005	3.8E-005	
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene		2.1E-005		4.3E-004	4.5E-004	
			1,3-Dichlorobenzene					1,3-Dichlorobenzene		3.1E-006		7.3E-005	7.6E-005	
			1,4-Dichlorobenzene	2.0E-010		3.3E-009	3.5E-009	1,4-Dichlorobenzene	GI tract	3.1E-006		5.2E-005	5.5E-005	
			Benzene	2.7E-008		1.1E-007	1.4E-007	Benzene	blood disorders	3.4E-003		1.4E-002	1.8E-002	
			Chlorobenzene					Chlorobenzene	liver	4.7E-006		1.4E-004	1.4E-004	
			Chloroethane	6.6E-010		8.8E-010	1.5E-009	Chloroethane	liver	6.3E-006		8.5E-006	1.5E-005	
			Chloroform	3.6E-010		7.3E-010	1.1E-009	Chloroform	circulatory system	6.6E-005		1.3E-004	2.0E-004	
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene		1.8E-003		3.5E-003	5.3E-003	
			Ethyl Benzene					Ethyl Benzene	lung	4.7E-006		7.6E-005	8.0E-005	
			m,p-xylene					m,p-xylene	fetotoxic	7.5E-007		1.4E-005	1.5E-005	
			Naphthalene					Naphthalene	spleen	3.8E-005		6.1E-004	6.4E-004	
			ortho-xylene					ortho-xylene	fetotoxic	1.4E-006		2.6E-005	2.8E-005	
			Tetrachloroethene	4.4E-010		6.4E-009	6.8E-009	Tetrachloroethene	liver	9.4E-006		1.4E-004	1.5E-004	
			Toluene					Toluene	liver	2.1E-005		1.8E-004	2.0E-004	
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene		1.4E-005		2.9E-006	1.7E-005	
			Trichloroethene	2.8E-010		1.1E-009	1.4E-009	Trichloroethene	liver	4.7E-005		1.8E-004	2.3E-004	
			Vinyl Chloride	2.2E-006		2.7E-006	4.9E-006	Vinyl Chloride						
						(Total)	2.3E-006		2.8E-006	5.1E-006	(Total)		6.6E-003	
Total Risk Across Surface Water				5.1E-006				Total Hazard Index Across All Exposure Routes						3.2E-002

Total Circulatory System HI = 1.1E-003  
Total Nervous System HI = 1.3E-004  
Total GI Tract HI = 5.5E-005  
Total Spleen HI = 6.4E-004  
Total Fetus HI = 8.1E-005  
Total Liver HI = 4.6E-003  
Total Lung HI = 8.0E-005  
Total Blood Disorders HI = 1.8E-002

Table 6-5-8  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Routine Worker
Receptor Age:	Adult

File: FWRKCT4B.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Water	Surface Water	Drainage Ditch Area 4B	1,1,1-Trichloroethane					1,1,1-Trichloroethane	liver	1.9E-004		6.7E-004	8.5E-004
			1,1,2,2-Tetrachloroethane	8.4E-011		2.9E-010	3.7E-010	1,1,2,2-Tetrachloroethane	liver	3.9E-007		1.3E-006	1.7E-006
			1,1,2-Trichloroethane	7.2E-011		1.6E-010	2.3E-010	1,1,2-Trichloroethane	circulatory system	1.8E-005		3.8E-005	5.6E-005
			1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	5.6E-005		8.5E-005	1.4E-004
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene		1.5E-005		4.8E-004	5.0E-004
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	nervous system	1.8E-006		2.6E-005	2.7E-005
			1,2-Dichloroethane	2.3E-010		2.1E-010	4.4E-010	1,2-Dichloroethane	fetotoxic	4.7E-006		4.2E-006	8.9E-006
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene		5.2E-006		9.2E-005	9.7E-005
			1,3-Dichlorobenzene					1,3-Dichlorobenzene		7.8E-007		1.6E-005	1.6E-005
			1,4-Dichlorobenzene	1.0E-011		1.4E-010	1.5E-010	1,4-Dichlorobenzene	GI tract	7.8E-007		1.1E-005	1.2E-005
			Benzene	1.3E-009		4.8E-009	6.1E-009	Benzene	blood disorders	8.6E-004		3.1E-003	3.9E-003
			Chlorobenzene					Chlorobenzene	liver	1.2E-006		3.0E-005	3.1E-005
			Chloroethane	3.3E-011		3.8E-011	7.1E-011	Chloroethane	liver	1.6E-006		1.8E-006	3.4E-006
			Chloroform	1.8E-011		3.2E-011	4.9E-011	Chloroform	circulatory system	1.6E-005		2.9E-005	4.5E-005
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene		4.5E-004		7.5E-004	1.2E-003
			Ethyl Benzene					Ethyl Benzene	lung	1.2E-006		1.6E-005	1.7E-005
			m,p-xylene					m,p-xylene	fetotoxic	1.9E-007		3.1E-006	3.3E-006
			Naphthalene					Naphthalene	spleen	9.4E-006		1.3E-004	1.4E-004
			ortho-xylene					ortho-xylene	fetotoxic	3.4E-007		5.7E-006	6.0E-006
			Tetrachloroethene	2.2E-011		2.7E-010	3.0E-010	Tetrachloroethene	liver	2.3E-006		3.0E-005	3.2E-005
			Toluene					Toluene	liver	5.3E-006		3.9E-005	4.5E-005
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene		3.5E-006		6.3E-007	4.2E-006
			Trichloroethene	1.4E-011		4.6E-011	6.0E-011	Trichloroethene	liver	1.2E-005		3.9E-005	5.1E-005
			Vinyl Chloride	1.1E-007		1.2E-007	2.3E-007	Vinyl Chloride					
			(Total)				1.1E-007		1.2E-007	2.4E-007	(Total)		1.7E-003
Total Risk Across Surface Water				2.4E-007				Total Hazard Index Across All Exposure Routes				7.2E-003	

Total Circulatory System HI =	2.4E-004
Total Nervous System HI =	2.7E-005
Total Blood Disorders HI =	3.9E-003
Total GI Tract HI =	1.2E-005
Total Spleen HI =	1.4E-004
Total Fetus HI =	1.8E-005
Total Liver HI =	1.0E-003
Total Lung HI =	1.7E-005



Table 6-5-9  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: CON4BRME WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	6.5E-006		7.9E-006	1.4E-005
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	7.6E-006		9.2E-006	1.7E-005
			4,4'-DDD	9.9E-010		1.2E-009	2.2E-009	4,4'-DDD	liver				
			4,4'-DDE	5.2E-009		6.3E-009	1.1E-008	4,4'-DDE	liver				
			4,4'-DDT	4.3E-009		1.6E-009	5.9E-009	4,4'-DDT	fetotoxic	2.4E-003		8.5E-004	3.2E-003
			Acetone					Acetone	fetotoxic	1.2E-006		1.9E-006	3.1E-006
			alpha-Chlordane	4.1E-009		2.0E-009	6.0E-009	alpha-Chlordane	liver	2.2E-003		1.0E-003	3.2E-003
			Anthracene					Anthracene	GI tract	4.2E-006		5.0E-006	9.2E-006
			Aroclor-1248	2.3E-008		2.8E-008	5.1E-008	Aroclor-1248	liver				
			Aroclor-1254	9.3E-007		1.8E-006	2.7E-006	Aroclor-1254	liver	2.2E+000		4.1E+000	6.3E+000
			Aroclor-1260	1.0E-007		1.2E-007	2.3E-007	Aroclor-1260	circulatory system				
			Arsenic	6.0E-007		2.3E-007	8.3E-007	Arsenic	circulatory system	1.2E-001		4.7E-002	1.7E-001
			Benzo(a)anthracene	1.4E-008		1.7E-008	3.1E-008	Benzo(a)anthracene					
			Benzo(a)pyrene	1.5E-007		2.8E-007	4.4E-007	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.7E-008		2.0E-008	3.7E-008	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	1.6E-009		1.9E-009	3.5E-009	Benzo(k)fluoranthene					
			beta-BHC	2.5E-009		3.0E-010	2.8E-009	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	3.0E-009		3.6E-009	6.5E-009	bis(2-Ethylhexyl)phthalate	liver	9.8E-004		1.2E-003	2.2E-003
			Cadmium					Cadmium	kidney	5.8E-002		1.4E+000	1.5E+000
			Carbazole	3.8E-011		4.6E-011	8.4E-011	Carbazole					
			Chromium (total)					Chromium (total)		5.4E-002		6.5E-002	1.2E-001
			Chrysene	1.5E-010		4.4E-010	5.9E-010	Chrysene	liver				
			Copper					Copper	liver	4.5E-003		9.1E-004	5.5E-003
			Di-n-butylphthalate					Di-n-butylphthalate	liver	4.1E-006		5.1E-006	9.3E-006
			Dibenzo(a,h)anthracene	1.1E-007		1.5E-007	2.6E-007	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	3.2E-004		3.9E-004	7.0E-004
			Endrin					Endrin	liver	2.5E-003		3.0E-003	5.4E-003
			Fluoranthene					Fluoranthene	kidney	4.8E-005		5.9E-005	1.1E-004
			gamma-BHC	2.0E-009		2.4E-009	4.4E-009	gamma-BHC	liver	4.7E-004		5.7E-004	1.0E-003
			gamma-Chlordane	8.9E-010		4.3E-010	1.3E-009	gamma-Chlordane	liver	4.7E-004		2.3E-004	7.0E-004
			Heptachlor	1.5E-008		1.8E-008	3.2E-008	Heptachlor	liver	6.1E-004		7.3E-004	1.3E-003
			Indeno(1,2,3-cd)pyrene	1.3E-008		1.6E-008	2.9E-008	Indeno(1,2,3-cd)pyrene					

Table 6-5-9  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: CON4BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Isophorone	2.1E-012		2.5E-012	4.6E-012	Isophorone	kidney	1.0E-006		1.2E-006	2.3E-006
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				
			Methoxychlor					Methoxychlor	reproductive system	2.8E-004		3.4E-004	6.3E-004
			Naphthalene					Naphthalene	circulatory system	6.1E-006		7.4E-006	1.4E-005
			Pyrene					Pyrene	liver	6.3E-005		7.6E-005	1.4E-004
			Zinc					Zinc	thyroid	4.9E-003		2.0E-003	6.9E-003
			(Total)	2.0E-006		2.7E-006	4.7E-006	(Total)		2.4E+000		5.6E+000	8.0E+000
Total Risk Across Sediments							4.7E-006	Total Hazard Index Across All Exposure Routes					8.0E+000

Total Reproductive System HI =	6.3E-004
Total Circulatory System HI =	1.7E-001
Total Fetotoxic HI =	3.2E-003
Total GI Tract HI =	2.6E-005
Total Thyroid HI =	6.9E-003
Total Kidney HI =	1.5E+000
Total Liver HI =	6.3E+000

TABLE 6-5-10  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: c:\projects\acs\rsk\tbls\UG4BFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Excavation Area 4B	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system			2.95E-003	2.95E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS			1.77E-001	1.77E-001
			1,2-Dichloroethane			5.71E-008	5.71E-008	1,2-Dichloroethane	fetotoxic			1.95E-003	1.95E-003
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney			2.44E-002	2.44E-002
			1,4-Dichlorobenzene			2.43E-007	2.43E-007	1,4-Dichlorobenzene	GI tract			3.15E-002	3.15E-002
			2,2'-oxybis(1-Chloropropane)			6.26E-006	6.26E-006	2,2'-oxybis(1-Chloropropane)	low body wt			2.09E-001	2.09E-001
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized			4.61E-001	4.61E-001
			4-Methylphenol (P-Cresol)					4-Methylphenol (P-Cresol)	respiratory			1.33E+000	1.33E+000
			Aluminum					Aluminum	circulatory system			8.33E-003	8.33E-003
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin			2.60E+000	2.60E+000
			Arochlor-1248			8.34E-004	8.34E-004	Arochlor-1248	liver				
			Arsenic			4.03E-006	4.03E-006	Arsenic	circulatory system			8.35E-001	8.35E-001
			Barium					Barium	NA			3.87E-002	3.87E-002
			Benzene			3.91E-003	3.91E-003	Benzene	blood disorders			4.20E+003	4.20E+003
			Beryllium					Beryllium	kidney			6.36E+000	6.36E+000
			bis(2-Chloroethyl)Ether			2.30E-005	2.30E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			3.33E-006	3.33E-006	bis(2-Ethylhexyl)Phthalate	liver			1.11E+000	1.11E+000
			Cadmium (water)					Cadmium (water)	kidney			6.46E-001	6.46E-001
			Chloroethane			2.55E-006	2.55E-006	Chloroethane	liver			2.05E-001	2.05E-001
			Chloromethane			2.14E-007	2.14E-007	Chloromethane	kidney				
			Chromium (VI)			1.91E-010	1.91E-010	Chromium (VI)				1.98E-001	1.98E-001
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system			1.10E-003	1.10E-003
			Cobalt					Cobalt	circulatory system			3.04E-004	3.04E-004
			Copper					Copper	liver			4.73E-003	4.73E-003
			Diethylphthalate					Diethylphthalate	low body wt			3.81E-004	3.81E-004
			Ethylbenzene					Ethylbenzene	liver			3.15E+000	3.15E+000
			Iron					Iron				8.85E-001	8.85E-001
			Isophorone			1.94E-009	1.94E-009	Isophorone	kidney			9.52E-004	9.52E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney			1.11E+000	1.11E+000
			Methylene Chloride			2.52E-007	2.52E-007	Methylene Chloride	liver			5.23E-002	5.23E-002
			Naphthalene					Naphthalene	circulatory system			5.18E-002	5.18E-002
			Nickel					Nickel	low body wt			2.76E-002	2.76E-002

TABLE 6-5-10

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\UG4BFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
			Nitrate/Nitrite				7.22E-007	7.22E-007	Nitrate/Nitrite	fetotoxic					
			Phenol						liver	1.21E-002					1.21E-002
			Thallium						NA	2.98E-001					2.98E-001
			Toluene						liver	2.73E+000					2.73E+000
			trans-1,2-Dichloroethene						kidney	1.18E-003					1.18E-003
			Vanadium						circulatory system	1.51E-002					1.51E-002
			Vinyl Chloride						liver						
			Xylene (mixed)						fetotoxic	7.36E-001					7.36E-001
			Zinc						thyroid	1.77E-002					1.77E-002
			(Total)												4.79E-003
	Air	Excavation Vapors	1,1-Dichloroethane		3.38E-009		1.04E-009	1.05E-007	1,1-Dichloroethane	kidney					
			1,2-Dichlorobenzene						low body weight	8.30E-003					8.30E-003
			1,2-Dichloroethane						circulatory system	2.47E-003					2.47E-003
			1,2-Dichloroethene(mixture)												
			1,4-Dichlorobenzene						liver	1.93E-005					1.93E-005
			2,2'-oxybis(1-Chloropropane)						liver						
			2,4-Dimethylphenol												
			4-Methylphenol (P-Cresol)						NA						
			Aluminum						respiratory system						
			Ammonia						respiratory system						
			Antimony												
			Arochlor-1248						NA						
			Arsenic						respiratory tract						
			Barium						fetotoxic						
			Benzene						blood disorders	1.20E+002					1.20E+002
Beryllium	lung														
bis(2-Chloroethyl)Ether	liver														
bis(2-Ethylhexyl)Phthalate	NA														
Cadmium (water)	respiratory tract														
Chloroethane	fetotoxic	1.48E-003	1.48E-003												
Chloromethane	kidney														
Chromium (VI)	respiratory tract														
cis-1,2-Dichloroethene															
Cobalt															
			Copper					Copper							

TABLE 6-5-10  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: c:\projects\acs\rsktbls\UG4BFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate					Diethylphthalate					
			Ethylbenzene					Ethylbenzene	respiratory tract		4.73E-003		4.73E-003
			Iron					Iron	NA				
			Isophorone					Isophorone					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		2.39E-009		2.39E-009	Methylene Chloride	respiratory tract		1.57E-004		1.57E-004
			Naphthalene					Naphthalene	circulatory system		4.82E-003		4.82E-003
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Thallium					Thallium					
			Toluene					Toluene	CNS		3.81E-002		3.81E-002
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium					
			Vinyl Chloride		6.67E-009		6.67E-009	Vinyl Chloride	CNS				
			Xylene (mixed)					Xylene (mixed)	CNS				
			Zinc					Zinc					
			(Total)		6.37E-005		6.37E-005	(Total)			1.20E+002		1.20E+002
				Total Risk Across Groundwater								Total Risk Across Groundwater	
				4.8E-003								4.3E+003	

Total Risk Across All Media and All Exposure Routes

Total Circulatory System HI = 9.2E-001  
Total Liver HI = 7.3E+000  
Total Kidney HI = 8.1E+000  
Total Skin HI = 2.6E+000  
Total Thyroid HI = 1.8E-002  
Total CNS HI = 2.1E-001  
Total Respiratory Tract HI = 1.3E+000  
Total GI Tract HI = 3.2E-002  
Total Blood Disorders HI = 4.3E+003

Table 6-5-11  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS4BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	6.8E-007		3.0E-006	3.7E-006
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	7.9E-007		3.5E-006	4.2E-006
			4,4'-DDD	7.9E-010		3.5E-009	4.3E-009	4,4'-DDD	liver				
			4,4'-DDE	4.2E-009		1.8E-008	2.3E-008	4,4'-DDE	liver				
			4,4'-DDT	3.4E-009		4.6E-009	8.0E-009	4,4'-DDT	fetotoxic	2.4E-004		3.2E-004	5.6E-004
			Acetone					Acetone	fetotoxic	1.3E-007		7.1E-007	8.3E-007
			alpha-Chlordane	3.3E-009		5.7E-009	9.0E-009	alpha-Chlordane	liver	2.2E-004		3.9E-004	6.2E-004
			Anthracene					Anthracene	GI tract	4.3E-007		1.9E-006	2.3E-006
			Aroclor-1248	1.9E-008		8.2E-008	1.0E-007	Aroclor-1248	liver				
			Aroclor-1254	7.4E-007		5.1E-006	5.9E-006	Aroclor-1254	liver	2.2E-001		1.5E+000	1.8E+000
			Aroclor-1260	8.2E-008		3.6E-007	4.4E-007	Aroclor-1260	circulatory system				
			Arsenic	4.8E-007		6.7E-007	1.2E-006	Arsenic	circulatory system	1.3E-002		1.8E-002	3.1E-002
			Benzo(a)anthracene	1.1E-008		4.9E-008	6.0E-008	Benzo(a)anthracene					
			Benzo(a)pyrene	1.2E-007		8.3E-007	9.5E-007	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.4E-008		6.0E-008	7.3E-008	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	1.3E-009		5.6E-009	6.8E-009	Benzo(k)fluoranthene					
			beta-BHC	2.0E-009		8.7E-010	2.8E-009	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	2.4E-009		1.0E-008	1.3E-008	bis(2-Ethylhexyl)phthalate	liver	1.0E-004		4.5E-004	5.5E-004
			Cadmium					Cadmium	kidney	6.0E-003		5.3E-001	5.3E-001
			Carbazole	3.0E-011		1.3E-010	1.6E-010	Carbazole					
			Chromium (total)					Chromium (total)		5.6E-003		2.4E-002	3.0E-002
			Chrysene	1.2E-010		1.3E-009	1.4E-009	Chrysene	liver				
			Copper					Copper	liver	4.7E-004		3.4E-004	8.1E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	4.3E-007		1.9E-006	2.4E-006
			Dibenzo(a,h)anthracene	8.9E-008		4.4E-007	5.3E-007	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	3.3E-005		1.5E-004	1.8E-004
			Endrin					Endrin	liver	2.5E-004		1.1E-003	1.4E-003
			Fluoranthene					Fluoranthene	kidney	5.0E-006		2.2E-005	2.7E-005
			gamma-BHC	1.6E-009		7.0E-009	8.6E-009	gamma-BHC	liver	4.9E-005		2.2E-004	2.6E-004
			gamma-Chlordane	7.1E-010		1.2E-009	2.0E-009	gamma-Chlordane	liver	4.9E-005		8.6E-005	1.3E-004
			Heptachlor	1.2E-008		5.2E-008	6.4E-008	Heptachlor	liver	6.3E-005		2.8E-004	3.4E-004
			Indeno(1,2,3-cd)pyrene	1.0E-008		4.6E-008	5.7E-008	Indeno(1,2,3-cd)pyrene					
			Isophorone	1.7E-012		7.4E-012	9.1E-012	Isophorone	kidney	1.1E-007		4.7E-007	5.8E-007

Table 6-5-11  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS4BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				
			Methoxychlor					Methoxychlor	reproductive system	2.9E-005		1.3E-004	1.6E-004
			Naphthalene					Naphthalene	circulatory system	6.3E-007		2.8E-006	3.4E-006
			Pyrene					Pyrene	liver	6.5E-006		2.9E-005	3.5E-005
			Zinc					Zinc	thyroid	5.1E-004		7.4E-004	1.2E-003
			(Total)	1.6E-006		7.8E-006	9.4E-006	(Total)		2.5E-001		2.1E+000	2.4E+000
Total Risk Across Sediments				9.4E-006				Total Hazard Index Across All Exposure Routes					2.4E+000

Total Reproductive System HI =	1.6E-004
Total Circulatory System HI =	3.1E-002
Total Fetotoxic HI =	5.7E-004
Total GI Tract HI =	6.6E-006
Total Thyroid HI =	1.2E-003
Total Kidney HI =	5.3E-001
Total Liver HI =	1.8E+000

Table 6-5-12  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS4BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 4B	1,2-Dichloroethene (total)					1,2-Dichloroethene (total)	kidney	1.7E-007		2.5E-007	4.3E-007
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	2.0E-007		2.9E-007	5.0E-007
			4,4'-DDD	1.8E-011		2.5E-011	4.3E-011	4,4'-DDD	liver				
			4,4'-DDE	9.3E-011		1.3E-010	2.3E-010	4,4'-DDE	liver				
			4,4'-DDT	7.7E-011		3.3E-011	1.1E-010	4,4'-DDT	fetotoxic	6.3E-005		2.7E-005	9.0E-005
			Acetone					Acetone	fetotoxic	3.3E-008		6.0E-008	9.3E-008
			alpha-Chlordane	7.2E-011		4.2E-011	1.1E-010	alpha-Chlordane	liver	5.8E-005		3.3E-005	9.1E-005
			Anthracene					Anthracene	GI tract	1.1E-007		1.6E-007	2.7E-007
			Aroclor-1248	4.1E-010		6.0E-010	1.0E-009	Aroclor-1248	liver				
			Aroclor-1254	1.7E-008		3.7E-008	5.4E-008	Aroclor-1254	liver	5.8E-002		1.3E-001	1.9E-001
			Aroclor-1260	1.8E-009		2.6E-009	4.4E-009	Aroclor-1260	circulatory system				
			Arsenic	1.1E-008		4.9E-009	1.6E-008	Arsenic	circulatory system	3.3E-003		1.5E-003	4.8E-003
			Benzo(a)anthracene	2.5E-010		3.6E-010	6.0E-010	Benzo(a)anthracene					
			Benzo(a)pyrene	2.7E-009		6.0E-009	8.8E-009	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.0E-010		4.3E-010	7.4E-010	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	2.8E-011		4.0E-011	6.9E-011	Benzo(k)fluoranthene					
			beta-BHC	4.4E-011		6.3E-012	5.0E-011	beta-BHC	liver				
			bis(2-Ethylhexyl)phthalate	5.3E-011		7.6E-011	1.3E-010	bis(2-Ethylhexyl)phthalate	liver	2.6E-005		3.8E-005	6.4E-005
			Cadmium					Cadmium	kidney	1.5E-003		4.5E-002	4.6E-002
			Carbazole	6.8E-013		9.7E-013	1.7E-012	Carbazole					
			Chromium (total)					Chromium (total)		1.4E-003		2.1E-003	3.5E-003
			Chrysene	2.7E-012		9.4E-012	1.2E-011	Chrysene	liver				
			Copper					Copper	liver	1.2E-004		2.9E-005	1.5E-004
			Di-n-butylphthalate					Di-n-butylphthalate	liver	1.1E-007		1.6E-007	2.7E-007
			Dibenzo(a,h)anthracene	2.0E-009		3.2E-009	5.2E-009	Dibenzo(a,h)anthracene					
			Endosulfan I					Endosulfan I	kidney	8.5E-006		1.2E-005	2.1E-005
			Endrin					Endrin	liver	6.6E-005		9.4E-005	1.6E-004
			Fluoranthene					Fluoranthene	kidney	1.3E-006		1.9E-006	3.2E-006
			gamma-BHC	3.5E-011		5.1E-011	8.6E-011	gamma-BHC	liver	1.3E-005		1.8E-005	3.1E-005
			gamma-Chlordane	1.6E-011		9.1E-012	2.5E-011	gamma-Chlordane	liver	1.3E-005		7.3E-006	2.0E-005
			Heptachlor	2.6E-010		3.8E-010	6.4E-010	Heptachlor	liver	1.6E-005		2.3E-005	4.0E-005
			Indeno(1,2,3-cd)pyrene	2.3E-010		3.4E-010	5.7E-010	Indeno(1,2,3-cd)pyrene					
			Isophorone	3.7E-014		5.4E-014	9.1E-014	Isophorone	kidney	2.8E-008		4.0E-008	6.7E-008



Table 6-5-12  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: TRS4BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Lead					Lead	CNS				
			Mercury					Mercury	low body weight				
			Methoxychlor					Methoxychlor	reproductive system	7.6E-006		1.1E-005	1.9E-005
			Naphthalene					Naphthalene	circulatory system	1.6E-007		2.4E-007	4.0E-007
			Pyrene					Pyrene	liver	1.7E-006		2.4E-006	4.1E-006
			Zinc					Zinc	thyroid	1.3E-004		6.3E-005	1.9E-004
			(Total)	3.6E-008		5.7E-008	9.2E-008	(Total)		6.5E-002		1.8E-001	2.4E-001
Total Risk Across Sediments				9.2E-008				Total Hazard Index Across All Exposure Routes					2.4E-001

Total Reproductive System HI =	1.9E-005
Total Circulatory System HI =	4.8E-003
Total Fetotoxic HI =	9.0E-005
Total GI Tract HI =	7.7E-007
Total Thyroid HI =	1.9E-004
Total Kidney HI =	4.6E-002
Total Liver HI =	1.9E-001

Table 6-5-13  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: cftres4b.wk4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Water	Surface Water	Area 4B Drainage Ditch	1,1,1-Trichloroethane					1,1,1-Trichloroethane	liver	1.8E-003		2.1E-003	3.9E-003
			1,1,2,2-Tetrachloroethane	3.8E-009		4.0E-009	7.7E-009	1,1,2,2-Tetrachloroethane	liver	3.8E-006		4.0E-006	7.7E-006
			1,1,2-Trichloroethane	3.2E-009		2.3E-009	5.5E-009	1,1,2-Trichloroethane	circulatory system	1.7E-004		1.2E-004	2.9E-004
			1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	5.4E-004		2.9E-004	8.3E-004
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene		1.4E-004		1.4E-003	1.6E-003
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	nervous system	1.8E-005		7.6E-005	9.4E-005
			1,2-Dichloroethane	1.0E-008		3.2E-009	1.3E-008	1,2-Dichloroethane	fetotoxic	4.5E-005		1.4E-005	5.9E-005
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene		5.0E-005		2.7E-004	3.2E-004
			1,3-Dichlorobenzene					1,3-Dichlorobenzene		7.5E-006		4.7E-005	5.4E-005
			1,4-Dichlorobenzene	4.5E-010		2.0E-009	2.4E-009	1,4-Dichlorobenzene	GI tract	7.5E-006		3.3E-005	4.1E-005
			Benzene	6.0E-008		7.7E-008	1.4E-007	Benzene	blood disorders	8.3E-003		1.1E-002	1.9E-002
			Chlorobenzene					Chlorobenzene	liver	1.1E-005		9.3E-005	1.0E-004
			Chloroethane	1.5E-009		6.3E-010	2.1E-009	Chloroethane	liver	1.5E-005		6.5E-006	2.2E-005
			Chloroform	8.0E-010		4.8E-010	1.3E-009	Chloroform	circulatory system	1.6E-004		9.5E-005	2.5E-004
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene		4.3E-003		2.5E-003	6.8E-003
			Ethyl Benzene					Ethyl Benzene	lung	1.1E-005		5.4E-005	6.6E-005
			m,p-xylene					m,p-xylene	fetotoxic	1.8E-006		1.0E-005	1.2E-005
			Naphthalene					Naphthalene	spleen	9.0E-005		3.9E-004	4.8E-004
			ortho-xylene					ortho-xylene	fetotoxic	3.3E-006		1.9E-005	2.2E-005
			Tetrachloroethene	9.8E-010		3.8E-009	4.8E-009	Tetrachloroethene	liver	2.3E-005		8.8E-005	1.1E-004
			Toluene					Toluene	liver	5.1E-005		1.3E-004	1.8E-004
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene		3.4E-005		2.1E-006	3.6E-005
			Trichloroethene	6.2E-010		6.9E-010	1.3E-009	Trichloroethene	liver	1.1E-004		1.3E-004	2.4E-004
			Vinyl Chloride	5.0E-006		1.9E-006	6.9E-006	Vinyl Chloride					
(Total)				5.1E-006		2.0E-006	7.1E-006	(Total)		1.6E-002		1.9E-002	3.4E-002
Total Risk Across Surface Water				7.1E-006				Total Hazard Index Across All Exposure Routes				3.4E-002	

Total Circulatory System HI =	1.4E-003
Total Nervous System HI =	9.4E-005
Total GI Tract HI =	4.1E-005
Total Spleen HI =	4.8E-004
Total Fetus HI =	9.4E-005
Total Liver HI =	4.6E-003
Total Lung HI =	6.6E-005
Total Blood Disorders HI =	1.9E-002

Table 6-5-14  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

File: tres4bct.wk4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Water	Surface Water	Drainage  Ditch Area 4B	1,1,1-Trichloroethane					1,1,1-Trichloroethane	liver	5.2E-004		6.7E-004	1.2E-003
			1,1,2,2-Tetrachloroethane	9.4E-011		1.2E-010	2.1E-010	1,1,2,2-Tetrachloroethane	liver	1.1E-006		1.3E-006	2.4E-006
			1,1,2-Trichloroethane	8.0E-011		6.3E-011	1.4E-010	1,1,2-Trichloroethane	circulatory system	4.9E-005		3.8E-005	8.7E-005
			1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	1.6E-004		8.6E-005	2.4E-004
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene		4.2E-005		4.9E-004	5.3E-004
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	nervous system	5.1E-006		2.6E-005	3.1E-005
			1,2-Dichloroethane	2.6E-010		8.3E-011	3.4E-010	1,2-Dichloroethane	fetotoxic	1.3E-005		4.3E-006	1.7E-005
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene		1.4E-005		9.3E-005	1.1E-004
			1,3-Dichlorobenzene					1,3-Dichlorobenzene		2.2E-006		1.6E-005	1.8E-005
			1,4-Dichlorobenzene	1.1E-011		5.8E-011	6.9E-011	1,4-Dichlorobenzene	GI tract	2.2E-006		1.1E-005	1.3E-005
			Benzene	1.5E-009		1.9E-009	3.4E-009	Benzene	blood disorders	2.4E-003		3.1E-003	5.5E-003
			Chlorobenzene					Chlorobenzene	liver	3.3E-006		3.0E-005	3.3E-005
			Chloroethane	3.7E-011		1.5E-011	5.2E-011	Chloroethane	liver	4.4E-006		1.8E-006	6.3E-006
			Chloroform	2.0E-011		1.3E-011	3.3E-011	Chloroform	circulatory system	4.6E-005		2.9E-005	7.5E-005
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene		1.2E-003		7.5E-004	2.0E-003
			Ethyl Benzene					Ethyl Benzene	lung	3.3E-006		1.6E-005	2.0E-005
			m,p-xylene					m,p-xylene	fetotoxic	5.2E-007		3.1E-006	3.7E-006
			Naphthalene					Naphthalene	spleen	2.6E-005		1.3E-004	1.6E-004
			ortho-xylene					ortho-xylene	fetotoxic	9.5E-007		5.7E-006	6.7E-006
			Tetrachloroethene	2.4E-011		1.1E-010	1.4E-010	Tetrachloroethene	liver	6.6E-006		3.0E-005	3.6E-005
			Toluene					Toluene	liver	1.5E-005		4.0E-005	5.4E-005
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene		9.8E-006		6.4E-007	1.0E-005
			Trichloroethene	1.5E-011		1.9E-011	3.4E-011	Trichloroethene	liver	3.3E-005		4.0E-005	7.2E-005
			Vinyl Chloride	1.2E-007		4.7E-008	1.7E-007	Vinyl Chloride					
			(Total)	1.3E-007		4.9E-008	1.8E-007	(Total)		4.6E-003		5.6E-003	1.0E-002
Total Risk Across Surface Water				1.8E-007				Total Hazard Index Across All Exposure Routes				1.0E-002	

Total Circulatory System HI =	4.1E-004
Total Nervous System HI =	3.1E-005
Total GI Tract HI =	1.3E-005
Total Spleen HI =	1.6E-004
Total Fetus HI =	2.8E-005
Total Liver HI =	1.4E-003
Total Lung HI =	2.0E-005
Total Blood Disorders HI =	5.5E-003

Table 6-6-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: Area5aRM.wk4\TT\_sum\_CRESaRM

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 5A, Surface Soil (0' to 2')	4,4'-DDE	4.1E-009	--	4.3E-008	4.7E-008	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	5.2E-009	--	5.5E-008	6.0E-008	4,4'-DDT	fetotoxic	3.6E-004	--	3.8E-003	4.1E-003
			alpha-BHC	7.2E-009	--	7.6E-008	8.3E-008	alpha-BHC	liver	--	--	--	--
			alpha-Chlordane	4.0E-009	--	4.2E-008	4.6E-008	alpha-Chlordane	liver	2.7E-004	--	2.8E-003	3.1E-003
			Aluminum	--	--	--	--	Aluminum	circulatory	7.8E-002	--	8.2E-001	9.0E-001
			Antimony	--	--	--	--	Antimony	skin	4.7E-001	--	4.9E+002	4.9E+002
			Aroclor-1248	3.1E-007	--	3.2E-006	3.5E-006	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	7.0E-007	--	8.3E-006	9.0E-006	Aroclor-1254	liver	2.0E-001	--	2.4E+000	2.6E+000
			Aroclor-1260	5.0E-007	--	5.3E-006	5.8E-006	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	5.6E-006	--	6.2E-005	6.7E-005	Arsenic	circulatory	1.4E-001	--	1.6E+000	1.7E+000
			Barium	--	--	--	--	Barium	--	2.2E-002	--	2.3E-001	2.5E-001
			Benzo(a)anthracene	7.1E-008	--	7.5E-007	8.2E-007	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	8.8E-007	--	1.1E-005	1.2E-005	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	8.8E-008	--	9.2E-007	1.0E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	7.0E-009	--	7.3E-008	8.0E-008	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	3.1E-003	--	3.2E+000	3.2E+000
			bis(2-Ethylhexyl)phthalate	9.7E-009	--	1.0E-007	1.1E-007	bis(2-Ethylhexyl)phthalate	liver	4.0E-004	--	4.2E-003	4.6E-003
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	3.6E-006	--	3.8E-005	4.1E-005
			Cadmium	--	--	--	--	Cadmium	kidney	1.9E-002	--	8.1E+000	8.1E+000
			Chromium 3+	--	--	--	--	Chromium 3+	liver	2.3E-004	--	6.2E-001	6.2E-001
			Chrysene	8.8E-010	--	2.3E-008	2.3E-008	Chrysene	liver	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	heart	1.2E-003	--	1.3E-002	1.4E-002
			Copper	--	--	--	--	Copper	liver	6.3E-003	--	1.1E-001	1.2E-001
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	8.3E-005	--	1.7E-003	1.8E-003
			Dieldrin	8.7E-008	--	9.1E-007	1.0E-006	Dieldrin	liver	1.3E-003	--	1.3E-002	1.5E-002
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	1.5E-005	--	1.7E-004	1.8E-004
			Endosulfan I	--	--	--	--	Endosulfan I	kidney	7.5E-006	--	7.8E-005	8.6E-005
			Endrin	--	--	--	--	Endrin	liver	2.3E-004	--	2.5E-003	2.7E-003
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	4.8E-005	--	5.0E-004	5.5E-004
			gamma-BHC	7.1E-010	--	7.4E-009	8.1E-009	gamma-BHC	liver	2.1E-005	--	2.2E-004	2.4E-004
			gamma-Chlordane	3.3E-009	--	3.4E-008	3.7E-008	gamma-Chlordane	liver	2.2E-004	--	2.3E-003	2.5E-003
			Heptachlor	6.4E-009	--	6.8E-008	7.4E-008	Heptachlor	liver	3.3E-005	--	3.5E-004	3.8E-004
			Heptachlor epoxide	4.8E-008	--	4.8E-007	5.3E-007	Heptachlor epoxide	liver	4.5E-003	--	4.8E-002	5.2E-002
			Indeno(1,2,3-cd)pyrene	7.0E-008	--	7.3E-007	8.0E-007	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Iron	--	--	--	--	Iron	--	4.4E-001	--	4.6E+000	5.0E+000
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	2.8E-001	--	2.9E+000	3.2E+000
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methoxychlor	--	--	--	--	Methoxychlor	reproductive	4.3E-005	--	4.6E-004	5.0E-004
			Methylene Chloride	5.8E-011	--	1.1E-009	1.2E-009	Methylene Chloride	liver	1.5E-006	--	2.8E-005	3.0E-005
			Nickel	--	--	--	--	Nickel	low body wt	1.1E-002	--	2.3E+000	2.3E+000
			Pyrene	--	--	--	--	Pyrene	liver	6.8E-005	--	7.2E-004	7.8E-004
			Selenium	--	--	--	--	Selenium	liver	1.5E-003	--	1.5E-002	1.7E-002
			Silver	--	--	--	--	Silver	skin	2.8E-003	--	1.4E-001	1.4E-001
			Toluene	--	--	--	--	Toluene	liver	1.3E-007	--	1.3E-006	1.5E-006
			Vanadium	--	--	--	--	Vanadium	circulatory	2.2E-002	--	2.3E-001	2.5E-001
			Zinc	--	--	--	--	Zinc	thyroid	5.0E-003	--	1.8E-001	1.8E-001
			(Total)	8.4E-008	--	9.4E-005	1.0E-004	(Total)	--	1.7E+000	--	5.2E+002	5.2E+002
Air	Air	Area 5A, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	1.27E-003	--	1.3E-003
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	7.20E-004	--	7.2E-004
			1,1,2-Trichloroethane	--	8.61E-011	--	6.6E-011	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	3.92E-009	--	3.9E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	3.59E-002	--	3.6E-002
			1,2-Dichloroethane	--	5.54E-007	--	5.5E-007	1,2-Dichloroethane	circulatory	--	5.08E-002	--	5.1E-002
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	6.20E-002	--	6.2E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	2.90E-004	--	2.9E-004
			1,4-Dichlorobenzene	--	1.15E-008	--	1.2E-008	1,4-Dichlorobenzene	liver	--	2.67E-005	--	2.7E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	1.12E-007	--	1.1E-007
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.09E+000	--	1.1E+000
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--

Table 6-6-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: Area5aRM wk4.1.YT\_sum\_CRES5aRM

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	9.08E-003	--	9.1E-003
			4-Methylphenol	--	--	--	--	4-Methylphenol		--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE		--	--	--	--
			4,4'-DDT	--	2.35E-012	--	2.4E-012	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene		--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene		--	--	--	--
			Acetone	--	--	--	--	Acetone		--	--	--	--
			Aldrin	--	5.70E-010	--	5.7E-010	Aldrin		--	--	--	--
			alpha-BHC	--	1.15E-011	--	1.2E-011	alpha-BHC		--	--	--	--
			Anthracene	--	--	--	--	Anthracene		--	--	--	--
			Antimony	--	--	--	--	Antimony		--	--	--	--
			Aroclor-1242	--	1.02E-010	--	1.0E-010	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	6.11E-010	--	6.1E-010	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	4.84E-010	--	4.8E-010	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	3.84E-009	--	3.8E-009	Aroclor-1260		--	--	--	--
			Arsenic	--	2.39E-009	--	2.4E-009	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	1.32E-003	--	1.3E-003
			Benzene	--	5.19E-007	--	5.2E-007	Benzene	blood disorders	--	1.23E-001	--	1.2E-001
			Benzoic Acid	--	--	--	--	Benzoic Acid		--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	2.63E-011	--	2.6E-011	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene		--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol		--	--	--	--
			Beryllium	--	1.15E-010	--	1.1E-010	Beryllium	respiratory	--	2.79E-005	--	2.8E-005
			beta-BHC	--	6.28E-012	--	6.3E-012	beta-BHC		--	--	--	--
			bis(2-Chloroethyl) ether	--	5.57E-006	--	5.6E-006	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	5.17E-011	--	5.2E-011	bis(2-Ethylhexyl)phthalate		--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate		--	--	--	--
			Cadmium	--	7.86E-009	--	7.9E-009	Cadmium		--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide		--	1.04E-008	--	1.0E-008
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	1.30E-002	--	1.3E-002
			Chloroform	--	1.72E-006	--	1.7E-006	Chloroform	liver	--	2.88E+000	--	2.9E+000
			Chromium 3+	--	--	--	--	Chromium 3+		--	--	--	--
			Chromium 6+	--	7.99E-008	--	8.0E-008	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene		--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene		--	--	--	--
			Cobalt	--	--	--	--	Cobalt		--	--	--	--
			Copper	--	--	--	--	Copper		--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)		--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran		--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate		--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate		--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate		--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate		--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone		--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	6.02E-003	--	6.0E-003
			Fluoranthene	--	--	--	--	Fluoranthene		--	--	--	--
			Fluorene	--	--	--	--	Fluorene		--	--	--	--
			Heptachlor	--	1.63E-012	--	1.6E-012	Heptachlor		--	--	--	--
			Heptachlor epoxide	--	1.58E-012	--	1.6E-012	Heptachlor epoxide		--	--	--	--
			Hexachlorobenzene	--	8.50E-014	--	8.5E-014	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	5.92E-012	--	5.9E-012	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Isophorone	--	--	--	--	Isophorone		--	--	--	--
			Lead	--	--	--	--	Lead		--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	8.10E-003	--	8.1E-003
			Mercury	--	--	--	--	Mercury	CNS	--	1.22E-005	--	1.2E-005
			Methylene Chloride	--	8.70E-008	--	8.7E-008	Methylene Chloride	respiratory	--	7.16E-004	--	7.2E-004

Table 6-6-1  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: Area5aRM wk4 \ TT\_sum\_CRESSaRM

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			m,p-xylene	--		--		m,p-xylene					
			Naphthalene	--		--		Naphthalene	circulatory		2.11E-001	--	2.1E-001
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	3.60E-004	--	3.6E-004
			Tetrachloroethene	--	9.70E-007	--	9.7E-007	Tetrachloroethene	liver	--	4.04E-002	--	4.0E-002
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	1.73E-001	--	1.7E-001
			Trichloroethene	--	8.36E-007	--	8.4E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	2.43E-007	--	2.4E-007	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		1.1E-005		1.1E-005	(total)			4.7E+000		4.7E+000
			Total Risk Across Surface Soil				1.1E-004	Total Hazard Index Across Surface Soil					5.3E+002
			Total Risk Across All Media and All Exposure Routes				Reserved						

Total Kidney HI:	1.5E+001
Total Skin HI:	4.9E+002
Total Thyroid HI:	1.8E-001
Total Liver HI:	6.4E+000
Total Circulatory System HI:	3.2E+000
Total CNS HI:	1.3E+000
Total Fetotoxic HI:	5.4E-003
Total GI Tract HI:	0.0E+000
Total Respiratory HI:	1.5E-002
Total Eyes HI:	0.0E+000
Total Reproductive HI:	5.0E-004
Total Mammary HI:	4.1E-005
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.4E-002
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	1.8E-001
Total Blood Disorders HI:	1.2E-001

Table 6-6-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: AreaSect wk4\TT\_sum\_CRE55aCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 5A, Surface Soil (0' to 2')	4,4'-DDE	2.0E-009	--	7.4E-009	9.4E-009	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	2.6E-009	--	9.4E-009	1.2E-008	4,4'-DDT	fetotoxic	1.8E-004	--	6.4E-004	8.2E-004
			alpha-BHC	3.6E-009	--	1.3E-008	1.7E-008	alpha-BHC	liver	--	--	--	--
			alpha-Chlordane	2.0E-009	--	7.2E-009	9.2E-009	alpha-Chlordane	liver	1.3E-004	--	4.8E-004	6.1E-004
			Aluminum	--	--	--	--	Aluminum	circulatory	3.9E-002	--	1.4E-001	1.8E-001
			Antimony	--	--	--	--	Antimony	skin	2.3E-001	--	8.5E+001	8.5E+001
			Aroclor-1248	1.5E-007	--	5.5E-007	7.1E-007	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	3.5E-007	--	1.4E-006	1.8E-006	Aroclor-1254	liver	1.0E-001	--	4.1E-001	5.2E-001
			Aroclor-1260	2.5E-007	--	9.1E-007	1.2E-006	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	2.8E-006	--	1.1E-005	1.3E-005	Arsenic	circulatory	7.2E-002	--	2.7E-001	3.5E-001
			Barium	--	--	--	--	Barium	circulatory	1.1E-002	--	3.9E-002	5.0E-002
			Benzo(a)anthracene	3.6E-008	--	1.3E-007	1.6E-007	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	4.4E-007	--	1.9E-006	2.3E-006	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	4.4E-008	--	1.6E-007	2.0E-007	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	3.5E-009	--	1.3E-008	1.6E-008	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	1.5E-003	--	5.5E-001	5.5E-001
			bis(2-Ethylhexyl)phthalate	4.8E-009	--	1.7E-008	2.2E-008	bis(2-Ethylhexyl)phthalate	liver	2.0E-004	--	7.2E-004	9.2E-004
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	1.8E-006	--	6.4E-006	8.2E-006
			Cadmium	--	--	--	--	Cadmium	kidney	9.6E-003	--	1.4E+000	1.4E+000
			Chromium 3+	--	--	--	--	Chromium 3+	liver	1.2E-004	--	1.1E-001	1.1E-001
			Chrysene	4.4E-010	--	3.9E-009	4.3E-009	Chrysene	liver	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	heart	6.0E-004	--	2.1E-003	2.7E-003
			Copper	--	--	--	--	Copper	liver	3.1E-003	--	1.9E-002	2.2E-002
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	4.2E-005	--	3.0E-004	3.4E-004
			Dieldrin	4.3E-008	--	1.6E-007	2.0E-007	Dieldrin	liver	6.3E-004	--	2.3E-003	2.9E-003
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	7.7E-006	--	2.8E-005	3.6E-005
			Endosulfan I	--	--	--	--	Endosulfan I	kidney	3.7E-006	--	1.3E-005	1.7E-005
			Endrin	--	--	--	--	Endrin	liver	1.2E-004	--	4.2E-004	5.4E-004
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	2.4E-005	--	8.6E-005	1.1E-004
			gamma-BHC	3.5E-010	--	1.3E-009	1.6E-009	gamma-BHC	liver	1.1E-005	--	3.8E-005	4.9E-005
			gamma-Chlordane	1.6E-009	--	5.9E-009	7.5E-009	gamma-Chlordane	liver	1.1E-004	--	3.9E-004	5.0E-004
			Heptachlor	3.2E-009	--	1.2E-008	1.5E-008	Heptachlor	liver	1.7E-005	--	6.0E-005	7.7E-005
			Heptachlor epoxide	2.3E-008	--	8.3E-008	1.1E-007	Heptachlor epoxide	liver	2.3E-003	--	8.1E-003	1.0E-002
			Indeno(1,2,3-cd)pyrene	3.5E-008	--	1.3E-007	1.6E-007	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Iron	--	--	--	--	Iron	--	2.2E-001	--	7.9E-001	1.0E+000
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	1.4E-001	--	5.1E-001	6.5E-001
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methoxychlor	--	--	--	--	Methoxychlor	reproductive	2.2E-005	--	7.8E-005	1.0E-004
			Methylene Chloride	2.9E-011	--	1.9E-010	2.2E-010	Methylene Chloride	liver	7.5E-007	--	4.9E-006	5.6E-006
			Nickel	--	--	--	--	Nickel	low body wt	5.5E-003	--	3.9E-001	4.0E-001
			Pyrene	--	--	--	--	Pyrene	liver	3.4E-005	--	1.2E-004	1.6E-004
			Selenium	--	--	--	--	Selenium	liver	7.3E-004	--	2.6E-003	3.4E-003
			Silver	--	--	--	--	Silver	skin	1.4E-003	--	2.4E-002	2.6E-002
			Toluene	--	--	--	--	Toluene	liver	6.4E-008	--	2.3E-007	2.9E-007
			Vanadium	--	--	--	--	Vanadium	circulatory	1.1E-002	--	3.9E-002	5.0E-002
			Zinc	--	--	--	--	Zinc	thyroid	2.5E-003	--	3.0E-002	3.3E-002
			(Total)	4.2E-006	--	1.6E-005	2.0E-005	(Total)	--	8.6E-001	--	8.9E+001	9.0E+001
Air	Air	Area 5A, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	9.56E-004	--	9.6E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	5.40E-004	--	5.4E-004
			1,1,2-Trichloroethane	--	4.96E-011	--	5.0E-011	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	2.94E-009	--	2.9E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	2.69E-002	--	2.7E-002
			1,2-Dichloroethane	--	4.16E-007	--	4.2E-007	1,2-Dichloroethane	circulatory	--	3.81E-002	--	3.8E-002
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	4.65E-002	--	4.6E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	2.18E-004	--	2.2E-004
			1,4-Dichlorobenzene	--	8.65E-009	--	8.6E-009	1,4-Dichlorobenzene	liver	--	2.00E-005	--	2.0E-005
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	8.43E-008	--	8.4E-008
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	8.20E-001	--	8.2E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--

Table 6-6-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: AreaSect wk41 TT\_sum\_CRESSACT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene		--	--	--	--
			3,3'-Dichlorobenzidine	--	--	--	--	3,3'-Dichlorobenzidine		--	--	--	--
			4-Methyl-2-pentanone	--	--	--	--	4-Methyl-2-pentanone	CNS	--	6.81E-003	--	6.8E-003
			4-Methylphenol	--	--	--	--	4-Methylphenol		--	--	--	--
			4,4'-DDD	--	--	--	--	4,4'-DDD		--	--	--	--
			4,4'-DDE	--	--	--	--	4,4'-DDE		--	--	--	--
			4,4'-DDT	--	1.77E-012	--	1.8E-012	4,4'-DDT	liver	--	--	--	--
			Acenaphthene	--	--	--	--	Acenaphthene		--	--	--	--
			Acenaphthylene	--	--	--	--	Acenaphthylene		--	--	--	--
			Acetone	--	--	--	--	Acetone		--	--	--	--
			Aldrin	--	4.27E-010	--	4.3E-010	Aldrin		--	--	--	--
			alpha-BHC	--	8.66E-012	--	8.7E-012	alpha-BHC		--	--	--	--
			Anthracene	--	--	--	--	Anthracene		--	--	--	--
			Antimony	--	--	--	--	Antimony		--	--	--	--
			Aroclor-1242	--	7.62E-011	--	7.6E-011	Aroclor-1242		--	--	--	--
			Aroclor-1248	--	4.58E-010	--	4.6E-010	Aroclor-1248		--	--	--	--
			Aroclor-1254	--	3.63E-010	--	3.6E-010	Aroclor-1254		--	--	--	--
			Aroclor-1260	--	2.88E-009	--	2.9E-009	Aroclor-1260		--	--	--	--
			Arsenic	--	1.79E-009	--	1.8E-009	Arsenic	respiratory	--	--	--	--
			Barium	--	--	--	--	Barium	fetotoxic	--	9.88E-004	--	9.9E-004
			Benzene	--	3.89E-007	--	3.9E-007	Benzene	blood disorders	--	9.21E-002	--	9.2E-002
			Benzoic Acid	--	--	--	--	Benzoic Acid		--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene		--	--	--	--
			Benzo(a)pyrene	--	1.97E-011	--	2.0E-011	Benzo(a)pyrene		--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene		--	--	--	--
			Benzo(g,h,i)perylene	--	--	--	--	Benzo(g,h,i)perylene		--	--	--	--
			Benzo(k)fluoranthene	--	--	--	--	Benzo(k)fluoranthene		--	--	--	--
			Benzyl Alcohol	--	--	--	--	Benzyl Alcohol		--	--	--	--
			Beryllium	--	8.59E-011	--	8.6E-011	Beryllium	respiratory	--	2.09E-005	--	2.1E-005
			beta-BHC	--	4.71E-012	--	4.7E-012	beta-BHC		--	--	--	--
			bis(2-Chloroethyl) ether	--	4.18E-006	--	4.2E-006	bis(2-Chloroethyl) ether	liver	--	--	--	--
			bis(2-Ethylhexyl)phthalate	--	3.88E-011	--	3.9E-011	bis(2-Ethylhexyl)phthalate		--	--	--	--
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate		--	--	--	--
			Cadmium	--	5.89E-009	--	5.9E-009	Cadmium		--	--	--	--
			Carbon Disulfide	--	--	--	--	Carbon Disulfide		--	7.80E-009	--	7.8E-009
			Chlorobenzene	--	--	--	--	Chlorobenzene	liver	--	9.73E-003	--	9.7E-003
			Chloroform	--	1.29E-006	--	1.3E-006	Chloroform	liver	--	2.16E+000	--	2.2E+000
			Chromium 3+	--	--	--	--	Chromium 3+		--	--	--	--
			Chromium 6+	--	5.99E-008	--	6.0E-008	Chromium 6+	respiratory	--	--	--	--
			Chrysene	--	--	--	--	Chrysene		--	--	--	--
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene		--	--	--	--
			Cobalt	--	--	--	--	Cobalt		--	--	--	--
			Copper	--	--	--	--	Copper		--	--	--	--
			Cyanide (total)	--	--	--	--	Cyanide (total)		--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran		--	--	--	--
			Diethylphthalate	--	--	--	--	Diethylphthalate		--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate		--	--	--	--
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate		--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate		--	--	--	--
			Endrin ketone	--	--	--	--	Endrin ketone		--	--	--	--
			Ethyl Benzene	--	--	--	--	Ethyl Benzene	respiratory	--	4.52E-003	--	4.5E-003
			Fluoranthene	--	--	--	--	Fluoranthene		--	--	--	--
			Fluorene	--	--	--	--	Fluorene		--	--	--	--
			Heptachlor	--	1.22E-012	--	1.2E-012	Heptachlor		--	--	--	--
			Heptachlor epoxide	--	1.18E-012	--	1.2E-012	Heptachlor epoxide		--	--	--	--
			Hexachlorobenzene	--	6.38E-014	--	6.4E-014	Hexachlorobenzene	liver	--	--	--	--
			Hexachlorobutadiene	--	4.44E-012	--	4.4E-012	Hexachlorobutadiene	kidney	--	--	--	--
			Hexane, n-	--	--	--	--	Hexane, n-		--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene		--	--	--	--
			Isophorone	--	--	--	--	Isophorone		--	--	--	--
			Lead	--	--	--	--	Lead		--	--	--	--
			Manganese	--	--	--	--	Manganese	respiratory	--	6.08E-003	--	6.1E-003
			Mercury	--	--	--	--	Mercury	CNS	--	9.14E-006	--	9.1E-006
			Methylene Chloride	--	6.53E-008	--	6.5E-008	Methylene Chloride	respiratory	--	5.37E-004	--	5.4E-004



Table 6-6-2  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population	Offsite Resident
Receptor Age	Child

File Area5sect wk41 TT\_sum\_CRESSect

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			m,p-xylene	--	--	--		m,p-xylene		--	--	--	
			Naphthalene	--	--	--		Naphthalene	circulatory respiratory	--	1.58E-001	--	1.6E-001
			Nickel	--	--	--		Nickel		--	--	--	
			N-Nitrosodiphenylamine	--	--	--		N-Nitrosodiphenylamine		--	--	--	
			ortho-xylene	--	--	--		ortho-xylene		--	--	--	
			Pentachlorophenol	--	--	--		Pentachlorophenol		--	--	--	
			Phenanthrene	--	--	--		Phenanthrene		--	--	--	
			Phenol	--	--	--		Phenol		--	--	--	
			Pyrene	--	--	--		Pyrene		--	--	--	
			Selenium	--	--	--		Selenium		--	--	--	
			Silver	--	--	--		Silver		--	--	--	
			Styrene	--	--	--		Styrene	CNS liver	--	2.70E-004	--	2.7E-004
			Tetrachloroethene	--	7.27E-007	--	7.3E-007	Tetrachloroethene		--	3.03E-002	--	3.0E-002
			Thallium	--	--	--		Thallium		--	--	--	
			Toluene	--	--	--		Toluene	CNS respiratory	--	1.30E-001	--	1.3E-001
			Trichloroethene	--	6.27E-007	--	6.3E-007	Trichloroethene		--	--	--	
			Vanadium	--	--	--		Vanadium		--	--	--	
			Vinyl Chloride	--	1.82E-007	--	1.8E-007	Vinyl Chloride	CNS	--	--	--	
			Xylenes (total)	--	--	--		Xylenes (total)	CNS	--	--	--	
			Zinc	--	--	--		Zinc		--	--	--	
			(total)		8.0E-006		8.0E-006	(total)			3.5E+000		3.5E+000
				Total Risk Across Surface Soil								Total Hazard Index Across Surface Soil	
				2.8E-005								9.4E+001	
				Reserved									
				Total Risk Across All Media and All Exposure Routes									

Total Kidney HI:	2.6E+000
Total Skin HI:	8.5E+001
Total Thyroid HI:	3.3E-002
Total Liver HI:	2.9E+000
Total Circulatory System HI:	7.7E-001
Total CNS HI:	9.6E-001
Total Fetotoxic HI:	1.8E-003
Total GI Tract HI:	0.0E+000
Total Respiratory HI:	1.1E-002
Total Eyes HI:	0.0E+000
Total Reproductive HI:	1.0E-004
Total Mammary HI:	8.2E-006
Total Adrenal HI:	0.0E+000
Total Heart HI:	2.7E-003
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	3.3E-002
Total Blood Disorders HI:	9.2E-002

TABLE 6-6-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acs\rsktbls\UG5AFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Upper Aquifer	Outdoor Use	Tap Water Area 5A	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	8.28E-005		1.52E-004	2.35E-004
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS	2.19E-004		6.41E-003	6.63E-003
			1,2-Dichloroethane	2.31E-008		2.53E-008	4.84E-008	1,2-Dichloroethane	fetotoxic	3.95E-004		4.33E-004	8.27E-004
			1,2-Dichloroethane(mixture)					1,2-Dichloroethane(mixture)	kidney	1.14E-002		2.34E-002	3.48E-002
			1,4-Dichlorobenzene	2.23E-008		6.74E-007	6.96E-007	1,4-Dichlorobenzene	GI tract	1.45E-003		4.37E-002	4.51E-002
			2,2'-oxybis(1-Chloropropane)	5.62E-008		5.04E-008	1.07E-007	2,2'-oxybis(1-Chloropropane)	low body wt	9.37E-004		8.40E-004	1.78E-003
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	1.14E-003		3.81E-003	4.95E-003
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	1.38E-003		1.16E-001	1.18E-001
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	9.86E-006		6.76E-006	1.66E-005
			Aluminum					Aluminum	circulatory system	1.35E-003		2.27E-004	1.58E-003
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	2.07E-002		3.48E-001	3.69E-001
			Arsenic	1.42E-005		2.51E-006	1.67E-005	Arsenic	circulatory system	1.47E+000		2.60E-001	1.73E+000
			Barium					Barium	NA	2.14E-002		3.60E-003	2.50E-002
			Benzene	7.35E-006		3.36E-005	4.09E-005	Benzene	blood disorders	3.95E+000		1.80E+001	2.20E+001
			Benzo(k)Fluoranthene	1.85E-008		4.94E-006	4.96E-006	Benzo(k)Fluoranthene	NA				
			Benzoic Acid					Benzoic Acid	GI tract	1.08E-005		1.76E-005	2.85E-005
			Beta-BHC	7.61E-009		1.21E-008	1.97E-008	Beta-BHC	liver				
			bis(2-Chloroethyl)Ether	6.88E-006		3.48E-006	1.04E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	3.43E-008		3.04E-006	3.07E-006	bis(2-Ethylhexyl)Phthalate	liver	5.72E-003		5.06E-001	5.12E-001
			Cadmium (water)					Cadmium (water)	kidney	2.37E-003		7.95E-003	1.03E-002
			Chlorobenzene					Chlorobenzene	liver	8.28E-003		2.32E-001	2.40E-001
			Chloroethane	1.77E-007		2.72E-007	4.48E-007	Chloroethane	liver	7.10E-003		1.09E-002	1.80E-002
			Chromium (VI)	1.56E-010		2.62E-010	4.19E-010	Chromium (VI)		1.22E-002		2.04E-002	3.26E-002
			Chrysene	1.85E-009		3.10E-006	3.10E-006	Chrysene	liver				
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system	7.89E-005		1.62E-004	2.41E-004
			Cobalt					Cobalt	circulatory system	2.76E-004		4.64E-005	3.23E-004
			Copper					Copper	liver	7.22E-003		2.02E-003	9.24E-003
			Cyanide					Cyanide	liver	3.43E-003		1.15E-003	4.59E-003
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA	9.27E-003		1.56E+000	1.57E+000

TABLE 6-6-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acsr\sktbls\UG5AFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate					Diethylphthalate	low body wt	9.86E-007		2.75E-006	3.74E-006
			Ethylbenzene					Ethylbenzene	liver	3.04E-002		4.93E-001	5.23E-001
			Iron					Iron		3.52E-001		5.92E-002	4.12E-001
			Isophorone	2.81E-009		2.92E-009	5.73E-009	Isophorone	kidney	6.90E-005		7.17E-005	1.41E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	7.87E-001		1.32E-001	9.19E-001
			Methylene Chloride	1.08E-008		1.77E-008	2.84E-008	Methylene Chloride	liver	1.12E-003		1.83E-003	2.95E-003
			Naphthalene					Naphthalene	circulatory system	1.38E-002		2.09E-001	2.23E-001
			Nickel					Nickel	low body wt	1.23E-002		4.12E-003	1.64E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	6.19E-002			6.19E-002
			Pentachlorophenol	3.04E-008		2.19E-005	2.19E-005	Pentachlorophenol	liver	3.95E-004		2.83E-001	2.84E-001
			Phenol					Phenol	liver	4.21E-004		4.74E-004	8.95E-004
			Selenium					Selenium	liver	2.05E-003		3.45E-004	2.40E-003
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene	kidney	5.92E-005		1.30E-005	7.22E-005
			Vanadium					Vanadium	circulatory system	1.46E-002		2.45E-003	1.70E-002
			Vinyl Chloride	6.43E-007		8.97E-007	1.54E-006	Vinyl Chloride	liver				
			Xylene (mixed)					Xylene (mixed)	fetotoxic	3.85E-002		6.50E-001	6.89E-001
			Zinc					Zinc	thyroid	1.17E-002		3.91E-003	1.56E-002
			(Total)	2.95E-005		7.45E-005	1.04E-004	(Total)		6.86E+000		2.30E+001	2.99E+001
Total Risk Across Groundwater							1.0E-004	Total Hazard Across Groundwater					3.0E+001
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	2.0E+000
Total Liver HI =	1.6E+000
Total Kidney HI =	9.6E-001
Total GI HI =	1.6E-001
Total CNS HI =	6.6E-003
Total Thyroid HI =	1.6E-002
Total Fetotoxic HI =	7.5E-001
Total Skin HI =	3.7E-001
Total Blood Disorders HI =	2.2E+001

TABLE 6-6-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\lacs\rsk\lsls\UG5AFCCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Upper Aquifer	Outdoor Use	Tap Water Area 5A	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	6.90E-006		1.51E-005	2.20E-005
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS	1.83E-005		7.93E-004	8.12E-004
			1,2-Dichloroethane	1.92E-009		2.50E-009	4.42E-009	1,2-Dichloroethane	fetotoxic	3.29E-005		4.27E-005	7.56E-005
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney	9.50E-004		2.30E-003	3.25E-003
			1,4-Dichlorobenzene	1.86E-009		8.34E-008	8.52E-008	1,4-Dichlorobenzene	GI tract	1.21E-004		5.40E-003	5.52E-003
			2,2'-oxybis(1-Chloropropane)	4.68E-009		3.60E-009	8.29E-009	2,2'-oxybis(1-Chloropropane)	low body wt	7.81E-005		6.00E-005	1.38E-004
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	9.53E-005		6.24E-004	7.19E-004
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	1.15E-004		1.44E-002	1.45E-002
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	8.22E-007		6.70E-007	1.49E-006
			Aluminum					Aluminum	circulatory system	1.13E-004		1.62E-005	1.29E-004
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	1.73E-003		2.49E-002	2.66E-002
			Arsenic	1.18E-006		1.79E-007	1.36E-006	Arsenic	circulatory system	1.23E-001		1.86E-002	1.41E-001
			Barium					Barium	NA	1.78E-003		2.57E-004	2.04E-003
			Benzene	6.13E-007		3.13E-006	3.74E-006	Benzene	blood disorders	3.29E-001		1.68E+000	2.01E+000
			Benzo(k)Fluoranthene	1.54E-009		8.07E-007	8.09E-007	Benzo(k)Fluoranthene	NA				
			Benzoic Acid					Benzoic Acid	GI tract	9.04E-007		2.88E-006	3.78E-006
			Beta-BHC	6.34E-010		1.49E-009	2.13E-009	Beta-BHC	liver				
			bis(2-Chloroethyl)Ether	5.73E-007		6.06E-007	1.18E-006	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	2.86E-009		3.76E-007	3.79E-007	bis(2-Ethylhexyl)Phthalate	liver	4.77E-004		6.26E-002	6.31E-002
			Cadmium (water)					Cadmium (water)	kidney	1.97E-004		5.68E-004	7.65E-004
			Chlorobenzene					Chlorobenzene	liver	6.90E-004		3.63E-002	3.70E-002
			Chloroethane	1.47E-008		2.44E-008	3.91E-008	Chloroethane	liver	5.92E-004		9.81E-004	1.57E-003
			Chromium (VI)	1.30E-011		1.87E-011	3.18E-011	Chromium (VI)		1.01E-003		1.46E-003	2.47E-003
			Chrysene	1.54E-010		3.84E-007	3.84E-007	Chrysene	liver				
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system	6.58E-006		1.59E-005	2.25E-005
			Cobalt					Cobalt	circulatory system	2.30E-005		3.31E-006	2.63E-005
			Copper					Copper	liver	6.02E-004		1.44E-004	7.46E-004
			Cyanide					Cyanide	liver	2.86E-004		8.24E-005	3.68E-004
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA	7.73E-004		1.11E-001	1.12E-001

TABLE 6-6-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acs\rsktbls\UG5AFCCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate	2.34E-010		5.02E-010	7.37E-010	Diethylphthalate	low body wt	8.22E-008		3.40E-007	4.23E-007
			Ethylbenzene					liver	2.53E-003	9.24E-002		9.49E-002	
			Iron						2.94E-002	4.23E-003		3.36E-002	
			Isophorone					kidney	5.75E-006	1.23E-005		1.81E-005	
			Lead					CNS					
			Manganese (nonfood)	8.98E-010	1.67E-009	2.57E-009	Manganese (nonfood)	kidney	6.56E-002	9.44E-003	7.50E-002		
			Methylene Chloride				liver	9.32E-005	1.73E-004	2.67E-004			
			Naphthalene				circulatory system	1.15E-003	4.69E-002	4.80E-002			
			Nickel				low body wt	1.02E-003	2.94E-004	1.32E-003			
			Nitrate/Nitrite				fetotoxic	5.16E-003		5.16E-003			
			Pentachlorophenol	2.54E-009	2.71E-006	2.71E-006	Pentachlorophenol	liver	3.29E-005	3.51E-002	3.51E-002		
			Phenol				liver	3.51E-005	4.61E-005	8.12E-005			
			Selenium				liver	1.71E-004	2.46E-005	1.96E-004			
			trans-1,2-Dichloroethene				kidney	4.93E-006	1.28E-006	6.21E-006			
			Vanadium				circulatory system	1.22E-003	1.75E-004	1.39E-003			
			Vinyl Chloride	5.35E-008	7.99E-008	1.33E-007	Vinyl Chloride	liver					
			Xylene (mixed)				fetotoxic	3.21E-003	1.22E-001	1.26E-001			
			Zinc				thyroid	9.71E-004	2.80E-004	1.25E-003			
			(Total)	2.46E-006		8.39E-006	1.08E-005	(Total)		5.72E-001		2.27E+000	2.84E+000
			Total Risk Across Groundwater				1.1E-005				Total Hazard Across Groundwater		
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	1.9E-001
Total Liver HI =	2.3E-001
Total Kidney HI =	7.9E-002
Total GI HI =	2.0E-002
Total CNS HI =	8.1E-004
Total Thyroid HI =	1.3E-003
Total Fetotoxic HI =	1.3E-001
Total Skin HI =	2.7E-002
Total Blood Disorders HI =	2.0E+000

TABLE 6-6-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acs\vs\kibis\LG5ACCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	2-Butanone (MEK)			1.56E-009	1.56E-009	2-Butanone (MEK)	liver	1.83E-004		1.56E-009	1.83E-004
			Antimony			1.64E-004	1.64E-004	Antimony	skin	3.88E-001		1.64E-004	3.88E-001
			Arsenic	4.46E-005		5.16E-006	4.98E-005	Arsenic	circulatory system	1.16E+000		5.16E-006	1.16E+000
			Barium			1.60E-006	1.60E-006	Barium	NA	3.78E-001		1.60E-006	3.78E-001
			bis(2-Ethylhexyl)Phthalate	1.10E-007			1.10E-007	bis(2-Ethylhexyl)Phthalate	liver	4.57E-003			4.57E-003
			Cadmium (water)			8.51E-006	8.51E-006	Cadmium (water)	kidney	1.00E-001		8.51E-006	1.00E-001
			Chloroform	4.77E-008			4.77E-008	Chloroform	circulatory system	9.13E-003			9.13E-003
			Copper			2.50E-006	2.50E-006	Copper	liver	3.54E-001		2.50E-006	3.54E-001
			Iron			5.81E-006	5.81E-006	Iron		1.37E+000		5.81E-006	1.37E+000
			Lead					Lead	CNS				
			Manganese (nonfood)			1.78E-005	1.78E-005	Manganese (nonfood)	kidney	4.21E+000		1.78E-005	4.21E+000
			Methylene Chloride	1.17E-008			1.17E-008	Methylene Chloride	liver	3.04E-004			3.04E-004
			Nickel			1.93E-007	1.93E-007	Nickel	low body wt	2.28E-002		1.93E-007	2.28E-002
			Trichloroethene	2.58E-008			2.58E-008	Trichloroethene	liver	4.57E-003			4.57E-003
			Vinyl Chloride	8.92E-006			8.92E-006	Vinyl Chloride	liver				
			Zinc			4.07E-006	4.07E-006	Zinc	thyroid	4.81E-001		4.07E-006	4.81E-001
			(Total)	5.37E-005		2.10E-004	2.64E-004	(Total)		8.49E+000		2.10E-004	8.49E+000

TABLE 6-6-5  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acs\sktbls\LG5ACCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	2-Butanone (MEK)					2-Butanone (MEK)	CNS		6.81E-007		6.81E-007
			Antimony					Antimony	respiratory tract				
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	respiratory tract				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	respiratory tract				
			Cadmium (water)					Cadmium (water)	respiratory tract				
			Chloroform		6.76E-010		6.76E-010	Chloroform	liver		9.13E-007		9.13E-007
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		2.75E-012		2.75E-012	Methylene Chloride	respiratory tract		2.44E-009		2.44E-009
			Nickel					Nickel	respiratory tract				
			Trichloroethene		1.50E-011		1.50E-011	Trichloroethene	respiratory tract				
			Vinyl Chloride		1.50E-009		1.50E-009	Vinyl Chloride	CNS				
			Zinc					Zinc					
			(Total)		2.20E-009		2.20E-009	(Total)			1.60E-006		1.60E-006

Total Risk Across Groundwater 2.6E-004  
Total Risk Across All Media and All Exposure Routes

Total Hazard Across Groundwater 8.5E+000

Total Circulatory System HI = 1.2E+000  
Total Liver HI = 3.6E-001  
Total Kidney HI = 4.3E+000  
Total Skin HI = 3.9E-001  
Total Thyroid HI = 4.8E-001  
Total CNS HI = 6.8E-007  
Total Respiratory Tract HI = 2.4E-009

TABLE 6-6-6  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acs\rskt\bls\LG5ACCCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	2-Butanone (MEK)					2-Butanone (MEK)	liver	4.57E-005		3.12E-010	4.57E-005
			Antimony					Antimony	skin	9.70E-002		1.56E-005	9.70E-002
			Arsenic	1.12E-005		1.86E-011	1.12E-005	Arsenic	circulatory system	2.89E-001		4.89E-007	2.89E-001
			Barium					Barium	NA	9.46E-002		1.52E-007	9.46E-002
			bis(2-Ethylhexyl)Phthalate	2.74E-008			2.74E-008	bis(2-Ethylhexyl)Phthalate	liver	1.14E-003			1.14E-003
			Cadmium (water)					Cadmium (water)	kidney	2.51E-002		8.07E-007	2.51E-002
			Chloroform	1.19E-008			1.19E-008	Chloroform	circulatory system	2.28E-003			2.28E-003
			Copper					Copper	liver	8.85E-002		2.37E-007	8.85E-002
			Iron					Iron		3.43E-001		5.51E-007	3.43E-001
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	1.05E+000		1.69E-006	1.05E+000
			Methylene Chloride	2.94E-009			2.94E-009	Methylene Chloride	liver	7.61E-005			7.61E-005
			Nickel					Nickel	low body wt	5.71E-003		1.83E-008	5.71E-003
			Trichloroethene	6.46E-009			6.46E-009	Trichloroethene	liver	1.14E-003			1.14E-003
			Vinyl Chloride	2.23E-006		8.82E-011	2.23E-006	Vinyl Chloride	liver				
			Zinc					Zinc	thyroid	1.20E-001		3.86E-007	1.20E-001
(Total)				1.34E-005		1.07E-010	1.34E-005	(Total)	2.12E+000		1.99E-005	2.12E+000	



TABLE 6-6-6  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe: Current  
Receptor Population: Offsite Resident  
Receptor Age: Child

File: c:\projects\acs\skt\sl\LG5ACCCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	2-Butanone (MEK)					2-Butanone (MEK)	CNS		3.39E-007		3.39E-007
			Antimony					Antimony	respiratory tract				
			Arsenic					Arsenic	fetotoxic				
			Barium					Barium	NA				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	respiratory tract				
			Cadmium (water)					Cadmium (water)	liver				
			Chloroform		3.36E-010		3.36E-010	Chloroform			4.54E-007		4.54E-007
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		1.37E-012		1.37E-012	Methylene Chloride	respiratory tract		1.21E-009		1.21E-009
			Nickel		7.48E-012		7.48E-012	Nickel	respiratory tract				
Trichloroethene		7.48E-010		7.48E-010	Trichloroethene	respiratory tract							
Vinyl Chloride					Vinyl Chloride	CNS							
Zinc					Zinc								
(Total)			1.09E-009		1.09E-009	(Total)			7.94E-007		7.94E-007		
Total Risk Across Groundwater							1.3E-005	Total Hazard Across Groundwater					2.1E+000

Total Circulatory System HI = 2.9E-001  
Total Liver HI = 9.1E-002  
Total Kidney HI = 1.1E+000  
Total Skin HI = 9.7E-002  
Total Thyroid HI = 1.2E-001  
Total CNS HI = 3.4E-007  
Total Respiratory Tract HI = 1.2E-009

TABLE 6-6-7  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\lacs\lrbis\LGSAFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	Aluminum	5.75E-005		2.53E-010	5.75E-005	Aluminum	circulatory system	6.92E-001		2.91E-006	6.92E-001
			Ammonia					kidney					
			Arsenic					circulatory system	1.49E+000			6.59E-006	1.49E+000
			Barium				Barium	NA	8.16E-001		3.44E-006	8.16E-001	
			Benzoic Acid				Benzoic Acid	GI tract	1.37E-004		1.56E-008	1.37E-004	
			Beryllium				Beryllium	kidney	5.01E-002		3.96E-004	5.04E-002	
			bis(2-Ethylhexyl)Phthalate	6.14E-006		2.86E-008	6.17E-006	bis(2-Ethylhexyl)Phthalate	liver	2.55E-001		1.20E-003	2.56E-001
			Chromium (VI)				Chromium (VI)		4.91E-001		2.07E-005	4.91E-001	
			Cobalt				Cobalt	circulatory system	1.02E-002		4.28E-008	1.02E-002	
			Copper				Copper	liver	2.84E-001		2.00E-006	2.84E-001	
			Iron				Iron		3.99E+000		1.68E-005	3.99E+000	
			Lead				Lead	CNS					
			Manganese (nonfood)				Manganese (nonfood)	kidney	1.35E+000		5.67E-006	1.35E+000	
			Nickel				Nickel	low body wt	3.38E-001		2.84E-006	3.38E-001	
			Nitrate/Nitrite				Nitrate/Nitrite	fetotoxic	8.28E-001			8.28E-001	
			Phenol				Phenol	liver	5.01E-002		3.49E-006	5.01E-002	
			Selenium				Selenium	liver	5.48E-002		2.30E-007	5.46E-002	
			Thallium				Thallium	NA	4.68E+000		1.97E-005	4.68E+000	
			Toluene				Toluene	liver	4.55E-005		2.56E-008	4.55E-005	
			Vanadium				Vanadium	circulatory system	1.65E-001		6.95E-007	1.65E-001	
			Zinc				Zinc	thyroid	1.29E-002		1.08E-007	1.29E-002	
(Total)				6.37E-005		2.89E-008	6.37E-005	(Total)		1.55E+001		1.68E-003	1.58E+001

TABLE 6-6-7  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\project\acs\sktbls\LG5AFCRM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	Aluminum					Aluminum	respiratory tract				
			Ammonia					Ammonia	respiratory tract		6.61E-004		6.61E-004
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzoic Acid					Benzoic Acid					
			Beryllium					Beryllium	lung				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Chromium (VI)					Chromium (VI)	respiratory tract				
			Cobalt					Cobalt					
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					
			Toluene					Toluene	CNS		4.85E-008		4.85E-008
			Vanadium					Vanadium					
			Zinc					Zinc					
			(Total)		0.00E+000		0.00E+000	(Total)			6.61E-004		6.61E-004
Total Risk Across Groundwater							6.4E-005	Total Hazard Across Groundwater					1.6E+001
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	2.4E+000
Total Liver HI =	6.5E-001
Total Kidney HI =	1.4E+000
Total GI Tract HI =	1.4E-004
Total CNS HI =	4.8E-008
Total Respiratory Tract HI =	6.6E-004
Total Thyroid HI =	1.3E-002

TABLE 6-8-8  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acs\risktbls\LG5AFCCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	Aluminum					Aluminum	circulatory system	1.75E-001		2.79E-007	1.75E-001
			Ammonia					Ammonia	kidney				
			Arsenic	1.44E-005		2.40E-011	1.44E-005	Arsenic	circulatory system	3.76E-001		8.30E-007	3.76E-001
			Barium					Barium	NA	2.06E-001		3.29E-007	2.06E-001
			Benzolic Acid					Benzolic Acid	GI tract	3.45E-005		2.11E-009	3.45E-005
			Beryllium					Beryllium	kidney	1.27E-002		3.79E-005	1.27E-002
			bis(2-Ethylhexyl)Phthalate	1.53E-008		3.84E-009	1.54E-008	bis(2-Ethylhexyl)Phthalate	liver	6.44E-002		1.62E-004	6.46E-002
			Chromium (VI)					Chromium (VI)		1.24E-001		1.98E-006	1.24E-001
			Cobalt					Cobalt	circulatory system	2.57E-003		4.09E-009	2.57E-003
			Copper					Copper	liver	7.19E-002		1.91E-007	7.19E-002
			Iron					Iron		1.01E+000		1.81E-006	1.01E+000
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	3.40E-001		5.43E-007	3.40E-001
			Nickel					Nickel	low body wt	8.53E-002		2.72E-007	8.53E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.09E-001			2.09E-001
			Phenol					Phenol	liver	1.27E-002		4.72E-007	1.27E-002
			Selenium					Selenium	liver	1.38E-002		2.20E-008	1.38E-002
			Thallium					Thallium	NA	1.18E+000		1.89E-006	1.18E+000
			Toluene					Toluene	liver	1.15E-005		3.47E-009	1.15E-005
			Vanadium					Vanadium	circulatory system	4.17E-002		6.85E-008	4.17E-002
			Zinc					Zinc	thyroid	3.25E-003		1.04E-008	3.25E-003
			(Total)	1.59E-005		3.86E-009	1.59E-005	(Total)		3.93E+000		2.08E-004	3.93E+000

TABLE 6-6-8  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Child

File: c:\projects\acsr\skt\bls\LGSAFCCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient								
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure				
	Air	Indoor Use Vapors	Aluminum					Aluminum	respiratory tract								
			Ammonia					Ammonia	respiratory tract		3.30E-004		3.30E-004				
			Arsenic					Arsenic	respiratory tract								
			Barium					Barium	fetotoxic								
			Benzoic Acid					Benzoic Acid									
			Beryllium					Beryllium	lung								
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA								
			Chromium (VI)					Chromium (VI)	respiratory tract								
			Cobalt					Cobalt									
			Copper					Copper									
			Iron					Iron									
			Lead					Lead									
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract								
			Nickel					Nickel	respiratory tract								
			Nitrate/Nitrite					Nitrate/Nitrite									
			Phenol					Phenol									
			Selenium					Selenium									
			Thallium					Thallium									
			Toluene					Toluene	CNS		2.42E-008		2.42E-008				
			Vanadium					Vanadium									
			Zinc					Zinc									
(Total)					0.00E+000		0.00E+000	(Total)					3.30E-004		3.30E-004		
Total Risk Across Groundwater							1.6E-005		Total Hazard Across Groundwater							3.9E+000	
Total Risk Across All Media and All Exposure Routes																	

Total Circulatory System HI =	5.9E-001
Total Liver HI =	1.6E-001
Total Kidney HI =	3.5E-001
Total GI Tract HI =	3.5E-005
Total CNS HI =	2.4E-008
Total Respiratory Tract HI =	3.3E-004
Total Thyroid HI =	3.3E-003

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

Table 6-6-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

File: Area5aRM.wk4 \ARESSaRM

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 5A, Surface Soil (0' to 2')	4,4'-DDE	1.8E-009	--	1.0E-007	1.0E-007	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	2.2E-009	--	1.3E-007	1.3E-007	4,4'-DDT	fetotoxic	3.8E-005	--	2.2E-003	2.3E-003
			alpha-BHC	3.1E-009	--	1.8E-007	1.8E-007	alpha-BHC	liver	--	--	--	--
			alpha-Chlordane	1.7E-009	--	1.0E-007	1.0E-007	alpha-Chlordane	liver	2.9E-005	--	1.7E-003	1.7E-003
			Aluminum	--	--	--	--	Aluminum	circulatory	8.4E-003	--	4.9E-001	4.9E-001
			Antimony	--	--	--	--	Antimony	skin	5.0E-002	--	2.9E+002	2.9E+002
			Aroclor-1248	1.3E-007	--	7.6E-006	7.8E-006	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	3.0E-007	--	2.0E-005	2.0E-005	Aroclor-1254	liver	2.2E-002	--	1.4E+000	1.5E+000
			Aroclor-1260	2.2E-007	--	1.3E-005	1.3E-005	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	2.4E-008	--	1.5E-004	1.5E-004	Arsenic	circulatory	1.6E-002	--	9.5E-001	9.6E-001
			Barium	--	--	--	--	Barium	circulatory	2.3E-003	--	1.3E-001	1.4E-001
			Benzo(a)anthracene	3.1E-008	--	1.8E-006	1.8E-006	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	3.8E-007	--	2.6E-005	2.6E-005	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	3.8E-008	--	2.2E-006	2.2E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	3.0E-009	--	1.7E-007	1.8E-007	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	3.3E-004	--	1.9E+000	1.9E+000
			bis(2-Ethylhexyl)phthalate	4.1E-009	--	2.4E-007	2.4E-007	bis(2-Ethylhexyl)phthalate	liver	4.3E-005	--	2.5E-003	2.5E-003
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	3.8E-007	--	2.2E-005	2.3E-005
			Cadmium	--	--	--	--	Cadmium	kidney	2.1E-003	--	4.8E+000	4.8E+000
			Chromium 3+	--	--	--	--	Chromium 3+	liver	2.5E-005	--	3.6E-001	3.6E-001
			Chrysene	3.8E-010	--	5.3E-008	5.4E-008	Chrysene	liver	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	heart	1.3E-004	--	7.4E-003	7.5E-003
			Copper	--	--	--	--	Copper	liver	8.7E-004	--	6.5E-002	6.6E-002
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	8.9E-006	--	1.0E-003	1.0E-003
			Dieldrin	3.7E-008	--	2.2E-006	2.2E-006	Dieldrin	liver	1.4E-004	--	7.9E-003	8.0E-003
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	1.6E-006	--	9.8E-005	1.0E-004
			Endosulfan I	--	--	--	--	Endosulfan I	kidney	8.0E-007	--	4.6E-005	4.7E-005
			Endrin	--	--	--	--	Endrin	liver	2.5E-005	--	1.5E-003	1.5E-003
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	5.1E-006	--	3.0E-004	3.0E-004
			gamma-BHC	3.0E-010	--	1.8E-008	1.8E-008	gamma-BHC	liver	2.3E-006	--	1.3E-004	1.3E-004
			gamma-Chlordane	1.4E-009	--	8.1E-008	8.2E-008	gamma-Chlordane	liver	2.3E-005	--	1.4E-003	1.4E-003
			Heptachlor	2.8E-009	--	1.6E-007	1.6E-007	Heptachlor	liver	3.6E-006	--	2.1E-004	2.1E-004
			Heptachlor epoxide	2.0E-008	--	1.1E-006	1.2E-006	Heptachlor epoxide	liver	4.8E-004	--	2.8E-002	2.9E-002
			Indeno(1,2,3-cd)pyrene	3.0E-008	--	1.7E-006	1.8E-006	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Iron	--	--	--	--	Iron	--	4.7E-002	--	2.7E+000	2.8E+000
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	3.0E-002	--	1.7E+000	1.8E+000
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methoxychlor	--	--	--	--	Methoxychlor	reproductive	4.7E-006	--	2.7E-004	2.7E-004
			Methylene Chloride	2.5E-011	--	2.6E-009	2.6E-009	Methylene Chloride	liver	1.6E-007	--	1.7E-005	1.7E-005
			Nickel	--	--	--	--	Nickel	low body wt	1.2E-003	--	1.4E+000	1.4E+000
			Pyrene	--	--	--	--	Pyrene	liver	7.3E-006	--	4.2E-004	4.3E-004
			Selenium	--	--	--	--	Selenium	liver	1.6E-004	--	9.1E-003	9.2E-003
			Silver	--	--	--	--	Silver	skin	3.0E-004	--	8.3E-002	8.4E-002
			Toluene	--	--	--	--	Toluene	liver	1.4E-008	--	7.9E-007	8.1E-007
			Vanadium	--	--	--	--	Vanadium	circulatory	2.3E-003	--	1.4E-001	1.4E-001
			Zinc	--	--	--	--	Zinc	thyroid	5.4E-004	--	1.0E-001	1.0E-001
			(Total)	3.6E-006	--	2.2E-004	2.3E-004	(Total)	thyroid	1.8E-001	--	3.1E+002	3.1E+002
AIR	AIR	Area 5A, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	2.73E-004	--	2.7E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	1.54E-004	--	1.5E-004
			1,1,2-Trichloroethane	--	5.67E-011	--	5.7E-011	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	3.36E-009	--	3.4E-009	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	7.69E-003	--	7.7E-003
			1,2-Dichloroethane	--	4.75E-007	--	4.8E-007	1,2-Dichloroethane	circulatory	--	1.09E-002	--	1.1E-002
			1,2-Dichloroethane (total)	--	--	--	--	1,2-Dichloroethane (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	1.33E-002	--	1.3E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	6.22E-005	--	6.2E-005
			1,4-Dichlorobenzene	--	9.88E-009	--	9.9E-009	1,4-Dichlorobenzene	liver	--	5.72E-006	--	5.7E-006
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	2.41E-008	--	2.4E-008

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

Table 6-6-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

File: Area5aRM.wk4 \ARES5aRM

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			2-Hexanone	--		--		2-Hexanone					
			2-Methylnaphthalene	--		--		2-Methylnaphthalene	CNS	--	2.34E-001	--	2.3E-001
			2-Methylphenol	--		--		2-Methylphenol		--		--	
			2,4-Dimethylphenol	--		--		2,4-Dimethylphenol		--		--	
			2,4,5-Trichlorophenol	--		--		2,4,5-Trichlorophenol		--		--	
			2,6-Dinitrotoluene	--		--		2,6-Dinitrotoluene		--		--	
			3,3'-Dichlorobenzidine	--		--		3,3'-Dichlorobenzidine		--		--	
			4-Methyl-2-pentanone	--		--		4-Methyl-2-pentanone	CNS	--	1.95E-003	--	1.9E-003
			4-Methylphenol	--		--		4-Methylphenol		--		--	
			4,4'-DDD	--		--		4,4'-DDD		--		--	
			4,4'-DDE	--		--		4,4'-DDE		--		--	
			4,4'-DDT	--	2.02E-012	--	2.0E-012	4,4'-DDT	liver	--		--	
			Acenaphthene	--		--		Acenaphthene		--		--	
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	4.88E-010	--	4.9E-010	Aldrin		--		--	
			alpha-BHC	--	9.90E-012	--	9.9E-012	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	8.71E-011	--	8.7E-011	Aroclor-1242		--		--	
			Aroclor-1248	--	5.23E-010	--	5.2E-010	Aroclor-1248		--		--	
			Aroclor-1254	--	4.15E-010	--	4.2E-010	Aroclor-1254		--		--	
			Aroclor-1260	--	3.29E-009	--	3.3E-009	Aroclor-1260		--		--	
			Arsenic	--	2.05E-009	--	2.0E-009	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--	2.82E-004	--	2.8E-004
			Benzene	--	4.45E-007	--	4.4E-007	Benzene	blood disorders	--	2.63E-002	--	2.6E-002
			Benzoic Acid	--		--		Benzoic Acid		--		--	
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	2.25E-011	--	2.3E-011	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	9.82E-011	--	9.8E-011	Beryllium	respiratory	--	5.98E-006	--	6.0E-006
			beta-BHC	--	5.38E-012	--	5.4E-012	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	4.77E-006	--	4.8E-006	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	4.43E-011	--	4.4E-011	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	6.73E-009	--	6.7E-009	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	2.23E-009	--	2.2E-009
			Chlorobenzene	--		--		Chlorobenzene	liver	--	2.78E-003	--	2.8E-003
			Chloroform	--	1.48E-008	--	1.5E-006	Chloroform	liver	--	6.18E-001	--	6.2E-001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	6.85E-008	--	6.8E-008	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	1.29E-003	--	1.3E-003
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Heptachlor	--	1.40E-012	--	1.4E-012	Heptachlor		--		--	

Table 6-6-9  
Summary of Receptor Risks and Hazards For COPCs  
Reasonable Maximum Exposure  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: Area5aRM.wk4 \ARES5aRM

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Heptachlor epoxide	--	1.35E-012	--	1.4E-012	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	7.29E-014	--	7.3E-014	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	5.07E-012	--	5.1E-012	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	1.74E-003	--	1.7E-003
			Mercury	--		--		Mercury	CNS	--	2.61E-006	--	2.6E-006
			Methylene Chloride	--	7.46E-008	--	7.5E-008	Methylene Chloride	respiratory	--	1.53E-004	--	1.5E-004
			m,p-xylene	--		--		m,p-xylene		--		--	
			Naphthalene	--		--		Naphthalene	circulatory	--	4.52E-002	--	4.5E-002
			Nickel	--		--		Nickel	respiratory	--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS	--	7.71E-005	--	7.7E-005
			Tetrachloroethene	--	8.31E-007	--	8.3E-007	Tetrachloroethene	liver	--	8.66E-003	--	8.7E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS	--	3.71E-002	--	3.7E-002
			Trichloroethene	--	7.16E-007	--	7.2E-007	Trichloroethene	respiratory	--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	2.08E-007	--	2.1E-007	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		9.1E-006		9.1E-006	(total)			1.0E+000		1.0E+000
Total Risk Across Surface Soil							2.3E-004	Total Hazard Index Across Surface Soil					3.1E+002
Total Risk Across All Media and All Exposure Routes							Reserved						

Total Kidney HI:	8.5E+000
Total Skin HI:	2.8E+002
Total Thyroid HI:	1.0E-001
Total Liver HI:	2.6E+000
Total Circulatory System HI:	1.7E+000
Total CNS HI:	2.7E-001
Total Fetotoxic HI:	2.5E-003
Total GI Tract HI:	0.0E+000
Total Respiratory HI:	3.2E-003
Total Eyes HI:	0.0E+000
Total Reproductive HI:	2.7E-004
Total Mammary HI:	2.3E-005
Total Adrenal HI:	0.0E+000
Total Heart HI:	7.5E-003
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	1.0E-001
Total Blood Disorders HI:	2.6E-002



Table 6-6-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe: Current/Future  
Receptor Population: Offsite Resident  
Receptor Age: Adult

File: Area5aRM wk4 \ARES5aCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Surface Soil	Soil	Area 5A, Surface Soil (0' to 2')	4,4'-DDE	3.3E-010	--	6.6E-009	6.9E-009	4,4'-DDE	liver	--	--	--	--
			4,4'-DDT	4.2E-010	--	8.4E-009	8.8E-009	4,4'-DDT	fetotoxic	1.9E-005	--	3.8E-004	4.0E-004
			alpha-BHC	5.8E-010	--	1.2E-008	1.2E-008	alpha-BHC	liver	--	--	--	--
			alpha-Chlordane	3.2E-010	--	6.4E-009	6.8E-009	alpha-Chlordane	liver	1.4E-005	--	2.9E-004	3.0E-004
			Aluminum	--	--	--	--	Aluminum	circulatory	4.2E-003	--	8.4E-002	8.8E-002
			Antimony	--	--	--	--	Antimony	skin	2.5E-002	--	5.0E+001	5.0E+001
			Aroclor-1248	2.5E-008	--	4.9E-007	5.2E-007	Aroclor-1248	liver	--	--	--	--
			Aroclor-1254	5.6E-008	--	1.3E-006	1.3E-006	Aroclor-1254	liver	1.1E-002	--	2.5E-001	2.6E-001
			Aroclor-1260	4.1E-008	--	8.1E-007	8.5E-007	Aroclor-1260	circulatory	--	--	--	--
			Arsenic	4.5E-007	--	9.5E-006	9.9E-006	Arsenic	circulatory	7.8E-003	--	1.6E-001	1.7E-001
			Barium	--	--	--	--	Barium	circulatory	1.2E-003	--	2.3E-002	2.4E-002
			Benzo(a)anthracene	5.7E-009	--	1.1E-007	1.2E-007	Benzo(a)anthracene	--	--	--	--	--
			Benzo(a)pyrene	7.1E-008	--	1.7E-006	1.7E-006	Benzo(a)pyrene	--	--	--	--	--
			Benzo(b)fluoranthene	7.1E-009	--	1.4E-007	1.5E-007	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(k)fluoranthene	5.6E-010	--	1.1E-008	1.2E-008	Benzo(k)fluoranthene	--	--	--	--	--
			Beryllium	--	--	--	--	Beryllium	kidney	1.6E-004	--	3.3E-001	3.3E-001
			bis(2-Ethylhexyl)phthalate	7.8E-010	--	1.6E-008	1.6E-008	bis(2-Ethylhexyl)phthalate	liver	2.2E-005	--	4.3E-004	4.5E-004
			Butylbenzylphthalate	--	--	--	--	Butylbenzylphthalate	mammary	1.9E-007	--	3.8E-006	4.0E-006
			Cadmium	--	--	--	--	Cadmium	kidney	1.0E-003	--	8.2E-001	8.2E-001
			Chromium 3+	--	--	--	--	Chromium 3+	liver	1.3E-005	--	6.3E-002	6.3E-002
			Chrysene	7.1E-011	--	3.4E-009	3.5E-009	Chrysene	liver	--	--	--	--
			Cobalt	--	--	--	--	Cobalt	heart	6.4E-005	--	1.3E-003	1.3E-003
			Copper	--	--	--	--	Copper	liver	3.4E-004	--	1.1E-002	1.2E-002
			Cyanide (total)	--	--	--	--	Cyanide (total)	liver	4.5E-006	--	1.8E-004	1.8E-004
			Dieldrin	7.0E-009	--	1.4E-007	1.5E-007	Dieldrin	liver	6.8E-005	--	1.4E-003	1.4E-003
			Di-n-butylphthalate	--	--	--	--	Di-n-butylphthalate	liver	8.2E-007	--	1.7E-005	1.8E-005
			Endosulfan I	--	--	--	--	Endosulfan I	kidney	4.0E-007	--	8.0E-008	8.4E-008
			Endrin	--	--	--	--	Endrin	liver	1.3E-005	--	2.5E-004	2.6E-004
			Fluoranthene	--	--	--	--	Fluoranthene	kidney	2.8E-006	--	5.1E-005	5.4E-005
			gamma-BHC	5.7E-011	--	1.1E-009	1.2E-009	gamma-BHC	liver	1.1E-006	--	2.3E-005	2.4E-005
			gamma-Chlordane	2.6E-010	--	5.2E-009	5.5E-009	gamma-Chlordane	liver	1.2E-005	--	2.3E-004	2.4E-004
			Heptachlor	5.2E-010	--	1.0E-008	1.1E-008	Heptachlor	liver	1.8E-006	--	3.6E-005	3.8E-005
			Heptachlor epoxide	3.7E-009	--	7.4E-008	7.7E-008	Heptachlor epoxide	liver	2.4E-004	--	4.8E-003	5.1E-003
			Indeno(1,2,3-cd)pyrene	5.6E-009	--	1.1E-007	1.2E-007	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Iron	--	--	--	--	Iron	--	2.4E-002	--	4.7E-001	4.9E-001
			Lead	--	--	--	--	Lead	CNS	--	--	--	--
			Manganese	--	--	--	--	Manganese	kidney	1.5E-002	--	3.0E-001	3.2E-001
			Mercury	--	--	--	--	Mercury	low body wt	--	--	--	--
			Methoxychlor	--	--	--	--	Methoxychlor	reproductive	2.3E-006	--	4.7E-005	4.9E-005
			Methylene Chloride	4.6E-012	--	1.7E-010	1.7E-010	Methylene Chloride	liver	8.0E-008	--	2.9E-006	3.0E-006
			Nickel	--	--	--	--	Nickel	low body wt	5.9E-004	--	2.3E-001	2.3E-001
			Pyrene	--	--	--	--	Pyrene	liver	3.7E-006	--	7.3E-005	7.7E-005
			Selenium	--	--	--	--	Selenium	liver	7.8E-005	--	1.6E-003	1.6E-003
			Silver	--	--	--	--	Silver	skin	1.5E-004	--	1.4E-002	1.5E-002
			Toluene	--	--	--	--	Toluene	liver	6.8E-009	--	1.4E-007	1.4E-007
			Vanadium	--	--	--	--	Vanadium	circulatory	1.2E-003	--	2.3E-002	2.5E-002
			Zinc	--	--	--	--	Zinc	thyroid	2.7E-004	--	1.8E-002	1.8E-002
			(Total)	6.7E-007	--	1.4E-005	1.5E-005	(Total)	--	9.2E-002	--	5.3E+001	5.3E+001
AIR	AIR	Area 5A, Surface Soil (0' to 2')	1,1-Dichloroethane	--	--	--	--	1,1-Dichloroethane	kidney	--	2.05E-004	--	2.0E-004
			1,1,1-Trichloroethane	--	--	--	--	1,1,1-Trichloroethane	liver	--	1.16E-004	--	1.2E-004
			1,1,2-Trichloroethane	--	1.59E-011	--	1.6E-011	1,1,2-Trichloroethane	liver	--	--	--	--
			1,1,2,2-Tetrachloroethane	--	9.44E-010	--	9.4E-010	1,1,2,2-Tetrachloroethane	liver	--	--	--	--
			1,2-Dichlorobenzene	--	--	--	--	1,2-Dichlorobenzene	low body weight	--	5.77E-003	--	5.8E-003
			1,2-Dichloroethane	--	1.34E-007	--	1.3E-007	1,2-Dichloroethane	circulatory	--	8.16E-003	--	8.2E-003
			1,2-Dichloroethene (total)	--	--	--	--	1,2-Dichloroethene (total)	--	--	--	--	--
			1,2-Dichloropropane	--	--	--	--	1,2-Dichloropropane	--	--	9.96E-003	--	1.0E-002
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	liver	--	4.66E-005	--	4.7E-005
			1,4-Dichlorobenzene	--	2.78E-009	--	2.8E-009	1,4-Dichlorobenzene	liver	--	4.29E-006	--	4.3E-006
			2-Butanone	--	--	--	--	2-Butanone	CNS	--	1.81E-008	--	1.8E-008
			2-Hexanone	--	--	--	--	2-Hexanone	CNS	--	1.76E-001	--	1.8E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	--	--	--	--	--
			2-Methylphenol	--	--	--	--	2-Methylphenol	--	--	--	--	--
			2,4-Dimethylphenol	--	--	--	--	2,4-Dimethylphenol	--	--	--	--	--
			2,4,5-Trichlorophenol	--	--	--	--	2,4,5-Trichlorophenol	--	--	--	--	--

Table 6-6-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe:	Current/Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: Area5aRM.wk4 \ARESSaCT

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			2,6-Dinitrotoluene	--		--		2,6-Dinitrotoluene		--		--	
			3,3'-Dichlorobenzidine	--		--		3,3'-Dichlorobenzidine		--		--	
			4-Methyl-2-pentanone	--		--		4-Methyl-2-pentanone	CNS	--	1.46E-003	--	1.5E-003
			4-Methylphenol	--		--		4-Methylphenol		--		--	
			4,4'-DDD	--		--		4,4'-DDD		--		--	
			4,4'-DDE	--		--		4,4'-DDE		--		--	
			4,4'-DDT	--	5.67E-013	--	5.7E-013	4,4'-DDT	liver	--		--	
			Acenaphthene	--		--		Acenaphthene		--		--	
			Acenaphthylene	--		--		Acenaphthylene		--		--	
			Acetone	--		--		Acetone		--		--	
			Aldrin	--	1.37E-010	--	1.4E-010	Aldrin		--		--	
			alpha-BHC	--	2.78E-012	--	2.8E-012	alpha-BHC		--		--	
			Anthracene	--		--		Anthracene		--		--	
			Antimony	--		--		Antimony		--		--	
			Aroclor-1242	--	2.45E-011	--	2.4E-011	Aroclor-1242		--		--	
			Aroclor-1248	--	1.47E-010	--	1.5E-010	Aroclor-1248		--		--	
			Aroclor-1254	--	1.17E-010	--	1.2E-010	Aroclor-1254		--		--	
			Aroclor-1260	--	9.25E-010	--	9.2E-010	Aroclor-1260		--		--	
			Arsenic	--	5.76E-010	--	5.8E-010	Arsenic	respiratory	--		--	
			Barium	--		--		Barium	fetotoxic	--	2.12E-004	--	2.1E-004
			Benzene	--	1.25E-007	--	1.3E-007	Benzene	blood disorders	--	1.97E-002	--	2.0E-002
			Benzoic Acid	--		--		Benzoic Acid		--		--	
			Benzo(a)anthracene	--		--		Benzo(a)anthracene		--		--	
			Benzo(a)pyrene	--	6.34E-012	--	6.3E-012	Benzo(a)pyrene		--		--	
			Benzo(b)fluoranthene	--		--		Benzo(b)fluoranthene		--		--	
			Benzo(g,h,i)perylene	--		--		Benzo(g,h,i)perylene		--		--	
			Benzo(k)fluoranthene	--		--		Benzo(k)fluoranthene		--		--	
			Benzyl Alcohol	--		--		Benzyl Alcohol		--		--	
			Beryllium	--	2.76E-011	--	2.8E-011	Beryllium	respiratory	--	4.48E-006	--	4.5E-006
			beta-BHC	--	1.51E-012	--	1.5E-012	beta-BHC		--		--	
			bis(2-Chloroethyl) ether	--	1.34E-006	--	1.3E-006	bis(2-Chloroethyl) ether	liver	--		--	
			bis(2-Ethylhexyl)phthalate	--	1.25E-011	--	1.2E-011	bis(2-Ethylhexyl)phthalate		--		--	
			Butylbenzylphthalate	--		--		Butylbenzylphthalate		--		--	
			Cadmium	--	1.89E-009	--	1.9E-009	Cadmium		--		--	
			Carbon Disulfide	--		--		Carbon Disulfide		--	1.87E-009	--	1.7E-009
			Chlorobenzene	--		--		Chlorobenzene	liver	--	2.08E-003	--	2.1E-003
			Chloroform	--	4.15E-007	--	4.1E-007	Chloroform	liver	--	4.63E-001	--	4.8E-001
			Chromium 3+	--		--		Chromium 3+		--		--	
			Chromium 6+	--	1.93E-008	--	1.9E-008	Chromium 6+	respiratory	--		--	
			Chrysene	--		--		Chrysene		--		--	
			cis-1,2-Dichloroethene	--		--		cis-1,2-Dichloroethene		--		--	
			Cobalt	--		--		Cobalt		--		--	
			Copper	--		--		Copper		--		--	
			Cyanide (total)	--		--		Cyanide (total)		--		--	
			Dibenzofuran	--		--		Dibenzofuran		--		--	
			Diethylphthalate	--		--		Diethylphthalate		--		--	
			Dimethylphthalate	--		--		Dimethylphthalate		--		--	
			Di-n-butylphthalate	--		--		Di-n-butylphthalate		--		--	
			Di-n-octylphthalate	--		--		Di-n-octylphthalate		--		--	
			Endrin ketone	--		--		Endrin ketone		--		--	
			Ethyl Benzene	--		--		Ethyl Benzene	respiratory	--	9.68E-004	--	9.7E-004
			Fluoranthene	--		--		Fluoranthene		--		--	
			Fluorene	--		--		Fluorene		--		--	
			Heptachlor	--	3.93E-013	--	3.9E-013	Heptachlor		--		--	
			Heptachlor epoxide	--	3.80E-013	--	3.8E-013	Heptachlor epoxide		--		--	
			Hexachlorobenzene	--	2.05E-014	--	2.0E-014	Hexachlorobenzene	liver	--		--	
			Hexachlorobutadiene	--	1.43E-012	--	1.4E-012	Hexachlorobutadiene	kidney	--		--	
			Hexane, n-	--		--		Hexane, n-		--		--	
			Indeno(1,2,3-cd)pyrene	--		--		Indeno(1,2,3-cd)pyrene		--		--	
			Isophorone	--		--		Isophorone		--		--	
			Lead	--		--		Lead		--		--	
			Manganese	--		--		Manganese	respiratory	--	1.30E-003	--	1.3E-003
			Mercury	--		--		Mercury	CNS	--	1.96E-006	--	2.0E-006
			Methylene Chloride	--	2.10E-008	--	2.1E-008	Methylene Chloride	respiratory	--	1.15E-004	--	1.2E-004

Table 6-6-10  
Summary of Receptor Risks and Hazards For COPCs  
Central Tendency  
American Chemical Services Site

Scenario Timeframe	Current/Future
Receptor Population	Offsite Resident
Receptor Age	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			<i>m,p-xylene</i>	--		--		<i>m,p-xylene</i>		--		--	
			Naphthalene	--		--		Naphthalene	circulatory respiratory	--	3.39E-002	--	3.4E-002
			Nickel	--		--		Nickel		--		--	
			N-Nitrosodiphenylamine	--		--		N-Nitrosodiphenylamine		--		--	
			ortho-xylene	--		--		ortho-xylene		--		--	
			Pentachlorophenol	--		--		Pentachlorophenol		--		--	
			Phenanthrene	--		--		Phenanthrene		--		--	
			Phenol	--		--		Phenol		--		--	
			Pyrene	--		--		Pyrene		--		--	
			Selenium	--		--		Selenium		--		--	
			Silver	--		--		Silver		--		--	
			Styrene	--		--		Styrene	CNS liver	--	5.78E-005	--	5.8E-005
			Tetrachloroethene	--	2.34E-007	--	2.3E-007	Tetrachloroethene		--	6.50E-003	--	6.5E-003
			Thallium	--		--		Thallium		--		--	
			Toluene	--		--		Toluene	CNS respiratory	--	2.78E-002	--	2.8E-002
			Trichloroethene	--	2.01E-007	--	2.0E-007	Trichloroethene		--		--	
			Vanadium	--		--		Vanadium		--		--	
			Vinyl Chloride	--	5.86E-008	--	5.9E-008	Vinyl Chloride	CNS	--		--	
			Xylenes (total)	--		--		Xylenes (total)	CNS	--		--	
			Zinc	--		--		Zinc		--		--	
			(total)		2.6E-006		2.6E-006	(total)			7.6E-001		7.6E-001
				Total Risk Across Surface Soil					Total Hazard Index Across Surface Soil				
				1.8E-005					5.4E+001				
			Total Risk Across All Media and All Exposure Routes				Reserved						

Total Kidney HI:	1.5E+000
Total Skin HI:	5.0E+001
Total Thyroid HI:	1.8E-002
Total Liver HI:	8.1E-001
Total Circulatory System HI:	3.3E-001
Total CNS HI:	2.1E-001
Total Fetotoxic HI:	6.1E-004
Total GI Tract HI:	0.0E+000
Total Respiratory HI:	2.4E-003
Total Eyes HI:	0.0E+000
Total Reproductive HI:	4.9E-005
Total Mammary HI:	4.0E-006
Total Adrenal HI:	0.0E+000
Total Heart HI:	1.3E-003
Total Skeletal System HI:	0.0E+000
Total Thyroid HI:	1.8E-002
Total Blood Disorders HI:	2.0E-002

TABLE 6-6-11  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Upper Aquifer	Outdoor Use	Tap Water Area 5A	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	3.95E-005		6.93E-005	1.09E-004
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS	1.04E-005		3.65E-004	3.76E-004
			1,2-Dichloroethane	7.33E-009		7.66E-009	1.50E-008	1,2-Dichloroethane	fetotoxic	1.88E-005		1.96E-005	3.84E-005
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney	5.43E-004		1.06E-003	1.60E-003
			1,4-Dichlorobenzene	7.09E-009		2.56E-007	2.63E-007	1,4-Dichlorobenzene	GI tract	6.89E-005		2.49E-003	2.56E-003
			2,2'-oxybis(1-Chloropropane)	1.78E-008		1.11E-008	2.89E-008	2,2'-oxybis(1-Chloropropane)	low body wt	4.46E-005		2.76E-005	7.23E-005
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	5.45E-004		2.87E-003	3.42E-003
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	6.58E-005		6.62E-003	6.69E-003
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	4.70E-006		3.08E-006	7.78E-006
			Aluminum					Aluminum	circulatory system	6.44E-005		7.47E-006	7.19E-005
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	9.86E-004		1.14E-002	1.24E-002
			Arsenic	4.51E-006		5.51E-007	5.06E-006	Arsenic	circulatory system	7.01E-002		8.56E-003	7.87E-002
			Barium					Barium	NA	1.02E-003		1.18E-004	1.14E-003
			Benzene	2.33E-006		9.61E-006	1.19E-005	Benzene	blood disorders	1.88E-001		7.73E-001	9.61E-001
			Benzo(k)Fluoranthene	5.88E-009		2.48E-006	2.48E-006	Benzo(k)Fluoranthene	NA				
			Benzoic Acid					Benzoic Acid	GI tract	5.17E-007		1.32E-006	1.84E-006
			Beta-BHC	2.42E-009		4.58E-009	7.00E-009	Beta-BHC	liver				
			bis(2-Chloroethyl)Ether	2.18E-006		1.86E-006	4.05E-006	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	1.09E-008		1.15E-006	1.16E-006	bis(2-Ethylhexyl)Phthalate	liver	2.72E-004		2.88E-002	2.91E-002
			Cadmium (water)					Cadmium (water)	kidney	1.13E-004		2.62E-004	3.74E-004
			Chlorobenzene					Chlorobenzene	liver	3.95E-004		1.67E-002	1.71E-002
			Chloroethane	5.60E-008		7.49E-008	1.31E-007	Chloroethane	liver	3.38E-004		4.52E-004	7.90E-004
			Chromium (VI)	4.96E-011		5.75E-011	1.07E-010	Chromium (VI)		3.86E-003		4.47E-003	8.33E-003
			Chrysene	5.88E-010		1.18E-006	1.18E-006	Chrysene	liver				
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system	3.76E-005		7.33E-005	1.11E-004
			Cobalt					Cobalt	circulatory system	1.32E-005		1.53E-006	1.47E-005
			Copper					Copper	liver	3.44E-004		6.65E-005	4.10E-004
			Cyanide					Cyanide	liver	1.63E-004		3.79E-005	2.01E-004
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA	4.41E-004		5.12E-002	5.17E-002

TABLE 6-6-11  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate					Diethylphthalate	low body wt	4.70E-007		1.57E-006	2.04E-006
			Ethylbenzene					Ethylbenzene	liver	1.45E-003		4.25E-002	4.40E-002
			Iron					Iron		1.68E-002		1.95E-003	1.87E-002
			Isophorone	8.92E-010		1.54E-009	2.43E-009	Isophorone	kidney	3.29E-005		5.68E-005	8.97E-005
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	3.75E-002		4.35E-003	4.18E-002
			Methylene Chloride	3.42E-009		5.13E-009	8.55E-009	Methylene Chloride	liver	5.32E-005		7.98E-005	1.33E-004
			Naphthalene					Naphthalene	circulatory system	1.32E-003		4.32E-002	4.45E-002
			Nickel					Nickel	low body wt	5.84E-004		1.36E-004	7.20E-004
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.95E-003			2.95E-003
			Pentachlorophenol	9.66E-009		8.30E-006	8.31E-006	Pentachlorophenol	liver	1.88E-005		1.61E-002	1.62E-002
			Phenol					Phenol	liver	2.00E-005		2.12E-005	4.13E-005
			Selenium					Selenium	liver	9.77E-005		1.13E-005	1.09E-004
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene	kidney	2.82E-005		5.89E-006	3.41E-005
			Vanadium					Vanadium	circulatory system	6.95E-004		8.06E-005	7.76E-004
			Vinyl Chloride	2.04E-007		2.45E-007	4.49E-007	Vinyl Chloride	liver				
			Xylene (mixed)					Xylene (mixed)	fetotoxic	3.66E-004		1.33E-002	1.36E-002
			Zinc					Zinc	thyroid	5.55E-004		1.29E-004	6.84E-004
			(Total)	9.35E-006		2.57E-005	3.51E-005	(Total)		3.30E-001		1.03E+000	1.36E+000
Total Risk Across Groundwater				3.5E-005				Total Hazard Across Groundwater					
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	1.2E-001
Total Liver HI =	1.1E-001
Total Kidney HI =	4.4E-002
Total GI HI =	9.2E-003
Total CNS HI =	3.8E-004
Total Thyroid HI =	6.8E-004
Total Fetotoxic HI =	1.7E-002
Total Skin HI =	1.2E-002
Total Blood Disorders HI =	9.6E-001

TABLE 6-6-12  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Upper Aquifer	Outdoor Use	Tap Water Area 5A	1,1-Dichloroethane					1,1-Dichloroethane	circulatory system	3.94E-005		5.98E-005	9.92E-005
			1,2-Dichlorobenzene					1,2-Dichlorobenzene	CNS	1.04E-005		3.15E-004	3.25E-004
			1,2-Dichloroethane	2.75E-009		2.48E-009	5.22E-009	1,2-Dichloroethane	fetotoxic	1.88E-005		1.69E-005	3.57E-005
			1,2-Dichloroethene(mixture)					1,2-Dichloroethene(mixture)	kidney	5.43E-004		9.13E-004	1.46E-003
			1,4-Dichlorobenzene	2.66E-009		8.27E-008	8.54E-008	1,4-Dichlorobenzene	GI tract	6.89E-005		2.14E-003	2.21E-003
			2,2'-oxybis(1-Chloropropane)	6.69E-009		3.57E-009	1.03E-008	2,2'-oxybis(1-Chloropropane)	low body wt	4.46E-005		2.38E-005	6.84E-005
			2,4-Dimethylphenol					2,4-Dimethylphenol	generalized	5.45E-004		2.47E-003	3.02E-003
			2-Methylnaphthalene					2-Methylnaphthalene	GI tract	6.57E-005		5.71E-003	5.77E-003
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	4.70E-006		2.66E-006	7.35E-006
			Aluminum					Aluminum	circulatory system	6.44E-005		6.44E-006	7.09E-005
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	9.86E-004		9.86E-003	1.08E-002
			Arsenic	1.69E-006		1.78E-007	1.87E-006	Arsenic	circulatory system	7.01E-002		7.38E-003	7.75E-002
			Barium					Barium	NA	1.02E-003		1.02E-004	1.12E-003
			Benzene	8.76E-007		3.11E-006	3.98E-006	Benzene	blood disorders	1.88E-001		6.66E-001	8.54E-001
			Benzo(k)Fluoranthene	2.20E-009		8.01E-007	8.03E-007	Benzo(k)Fluoranthene	NA				
			Benzoic Acid					Benzoic Acid	GI tract	5.17E-007		1.14E-006	1.66E-006
			Beta-BHC	9.06E-010		1.48E-009	2.39E-009	Beta-BHC	liver				
			bis(2-Chloroethyl)Ether	8.19E-007		6.01E-007	1.42E-006	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	4.09E-009		3.73E-007	3.77E-007	bis(2-Ethylhexyl)Phthalate	liver	2.72E-004		2.48E-002	2.51E-002
			Cadmium (water)					Cadmium (water)	kidney	1.13E-004		2.25E-004	3.38E-004
			Chlorobenzene					Chlorobenzene	liver	3.94E-004		1.44E-002	1.48E-002
			Chloroethane	2.10E-008		2.42E-008	4.52E-008	Chloroethane	liver	3.38E-004		3.89E-004	7.28E-004
			Chromium (VI)	1.86E-011		1.86E-011	3.72E-011	Chromium (VI)		3.86E-003		3.86E-003	7.71E-003
			Chrysene	2.20E-010		3.81E-007	3.81E-007	Chrysene	liver				
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system	3.76E-005		6.32E-005	1.01E-004
			Cobalt					Cobalt	circulatory system	1.31E-005		1.31E-006	1.45E-005
			Copper					Copper	liver	3.44E-004		5.73E-005	4.01E-004
			Cyanide					Cyanide	liver	1.63E-004		3.27E-005	1.96E-004
			Di-n-Octyl Phthalate					Di-n-Octyl Phthalate	NA	4.41E-004		4.41E-002	4.46E-002

TABLE 6-6-12  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Diethylphthalate					Diethylphthalate	low body wt	4.70E-007		1.35E-006	1.82E-006
			Ethylbenzene					Ethylbenzene	liver	1.45E-003		3.67E-002	3.81E-002
			Iron					Iron		1.68E-002		1.68E-003	1.85E-002
			Isophorone	3.35E-010		4.98E-010	8.33E-010	Isophorone	kidney	3.29E-005		4.90E-005	8.18E-005
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	3.75E-002		3.75E-003	4.12E-002
			Methylene Chloride	1.28E-009		1.66E-009	2.94E-009	Methylene Chloride	liver	5.32E-005		6.88E-005	1.22E-004
			Naphthalene					Naphthalene	circulatory system	1.31E-003		3.72E-002	3.85E-002
			Nickel					Nickel	low body wt	5.84E-004		1.17E-004	7.01E-004
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.95E-003			2.95E-003
			Pentachlorophenol	3.62E-009		2.68E-006	2.69E-006	Pentachlorophenol	liver	1.88E-005		1.39E-002	1.39E-002
			Phenol					Phenol	liver	2.00E-005		1.83E-005	3.83E-005
			Selenium					Selenium	liver	9.77E-005		9.77E-006	1.07E-004
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene	kidney	2.82E-005		5.07E-006	3.32E-005
			Vanadium					Vanadium	circulatory system	6.95E-004		6.95E-005	7.64E-004
			Vinyl Chloride	7.65E-008		7.93E-008	1.56E-007	Vinyl Chloride	liver				
			Xylene (mixed)					Xylene (mixed)	fetotoxic	3.66E-004		1.14E-002	1.18E-002
			Zinc					Zinc	thyroid	5.55E-004		1.11E-004	6.66E-004
			(Total)	3.51E-006		8.32E-006	1.18E-005	(Total)		3.30E-001		8.89E-001	1.22E+000

Total Risk Across Groundwater 1.2E-005  
Total Risk Across All Media and All Exposure Routes

Total Hazard Across Groundwater 1.2E+000

Total Circulatory System HI = 1.2E-001  
Total Liver HI = 9.4E-002  
Total Kidney HI = 4.3E-002  
Total GI HI = 7.7E-002  
Total CNS HI = 3.3E-004  
Total Thyroid HI = 6.7E-004  
Total Fetotoxic HI = 1.5E-002  
Total Skin HI = 1.1E-002  
Total Blood Disorders HI = 8.5E-001

TABLE 6-6-13  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\acs\risktbl\LG5ACARM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	2-Butanone (MEK)					2-Butanone (MEK)	liver	1.83E-004		2.62E-006	1.85E-004
			Antimony					Antimony	skin	1.16E-001		7.81E-002	1.95E-001
			Arsenic	5.35E-005		3.78E-007	5.39E-005	Arsenic	circulatory system	3.47E-001		2.45E-003	3.49E-001
			Barium					Barium	NA	1.14E-001		7.61E-004	1.14E-001
			bis(2-Ethylhexyl)Phthalate	1.32E-007		1.05E-006	1.19E-006	bis(2-Ethylhexyl)Phthalate	liver	1.37E-003		1.10E-002	1.23E-002
			Cadmium (water)					Cadmium (water)	kidney	6.03E-002		8.09E-003	6.84E-002
			Chloroform	5.73E-008		1.36E-008	7.09E-008	Chloroform	circulatory system	2.74E-003		6.50E-004	3.39E-003
			Copper					Copper	liver	1.06E-001		1.19E-003	1.07E-001
			Iron					Iron		4.12E-001		2.76E-003	4.15E-001
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	1.28E+000		8.48E-003	1.27E+000
			Methylene Chloride	1.41E-008		2.32E-009	1.84E-008	Methylene Chloride	liver	9.13E-005		1.51E-005	1.06E-004
			Nickel					Nickel	low body wt	6.85E-003		9.19E-005	6.94E-003
			Trichloroethene	3.10E-008		1.40E-008	4.50E-008	Trichloroethene	liver	1.37E-003		6.19E-004	1.99E-003
			Vinyl Chloride	1.07E-005		9.02E-007	1.16E-005	Vinyl Chloride	liver				
			Zinc					Zinc	thyroid	1.44E-001		1.94E-003	1.46E-001
			(Total)	6.45E-005		2.38E-006	6.68E-005	(Total)		2.58E+000		1.16E-001	2.69E+000



TABLE 6-6-13  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\acs\skiba\LG5ACARM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	2-Butanone (MEK)					2-Butanone (MEK)	CNS		4.61E-005		4.61E-005
			Antimony					Antimony	respiratory tract				
			Arsenic					Arsenic	fetotoxic				
			Barium					Barium	NA				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	respiratory tract				
			Cadmium (water)					Cadmium (water)	liver				
			Chloroform		1.83E-007		1.83E-007	Chloroform			3.83E-002		3.83E-002
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		7.46E-010		7.46E-010	Methylene Chloride	respiratory tract		7.67E-007		7.67E-007
			Nickel					Nickel	respiratory tract				
			Trichloroethene		4.07E-009		4.07E-009	Trichloroethene	respiratory tract				
			Vinyl Chloride		4.07E-007		4.07E-007	Vinyl Chloride	CNS				
			Zinc					Zinc					
(Total)					5.95E-007		5.95E-007	(Total)		3.84E-002		3.84E-002	
				Total Risk Across Groundwater				Total Hazard Across Groundwater					
				6.7E-005				2.7E+000					
				Total Risk Across All Media and All Exposure Routes									

Total Circulatory System HI =	3.5E-001
Total Liver HI =	1.6E-001
Total Kidney HI =	1.3E+000
Total Skin HI =	1.9E-001
Total Thyroid HI =	1.5E-001
Total CNS HI =	4.8E-005
Total Respiratory Tract HI =	7.7E-007

TABLE 6-6-14  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\acs\skt\bls\LG5ACACT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	2-Butanone (MEK)					2-Butanone (MEK)	liver	1.28E-004		1.83E-006	1.30E-004
			Antimony					Antimony	skin	8.15E-002		1.94E-002	1.01E-001
			Arsenic	1.41E-005		3.52E-008	1.41E-005	Arsenic	circulatory system	2.43E-001		6.09E-004	2.44E-001
			Barium					Barium	NA	7.95E-002		1.89E-004	7.96E-002
			bis(2-Ethylhexyl)Phthalate	3.45E-008		1.84E-007	2.18E-007	bis(2-Ethylhexyl)Phthalate	liver	9.59E-004		5.10E-003	6.06E-003
			Cadmium (water)					Cadmium (water)	kidney	4.22E-002		2.01E-003	4.42E-002
			Chloroform	1.50E-008		2.37E-009	1.74E-008	Chloroform	circulatory system	1.92E-003		3.02E-004	2.22E-003
			Copper					Copper	liver	7.43E-002		2.95E-004	7.46E-002
			Iron					Iron		2.88E-001		6.86E-004	2.89E-001
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	8.85E-001		2.11E-003	8.87E-001
			Methylene Chloride	3.70E-009		4.05E-010	4.10E-009	Methylene Chloride	liver	6.39E-005		7.00E-006	7.09E-005
			Nickel					Nickel	low body wt	4.78E-003		2.28E-005	4.82E-003
			Trichloroethene	8.14E-009		2.44E-009	1.06E-008	Trichloroethene	liver	9.59E-004		2.88E-004	1.25E-003
			Vinyl Chloride	2.81E-006		2.38E-007	3.05E-006	Vinyl Chloride	liver				
			Zinc					Zinc	thyroid	1.01E-001		4.81E-004	1.01E-001
			(Total)	1.68E-005		4.80E-007	1.74E-005	(Total)		1.80E+000		3.15E-002	1.84E+000

TABLE 6-6-14  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Current
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\acs\risk\bis\LGSA\ACT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	2-Butanone (MEK)					2-Butanone (MEK)	CNS		1.35E-005		1.35E-005
			Antimony					Antimony					
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Cadmium (water)					Cadmium (water)	respiratory tract				
			Chloroform		2.01E-008		2.01E-008	Chloroform	liver		1.12E-002		1.12E-002
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Methylene Chloride		8.20E-011		8.20E-011	Methylene Chloride	respiratory tract		2.25E-007		2.25E-007
			Nickel					Nickel	respiratory tract				
			Trichloroethene		4.47E-010		4.47E-010	Trichloroethene	respiratory tract				
			Vinyl Chloride		4.47E-008		4.47E-008	Vinyl Chloride	respiratory tract				
			Zinc					Zinc	CNS				
			(Total)		6.54E-008		6.54E-008	(Total)			1.13E-002		1.13E-002
Total Risk Across Groundwater							1.7E-005	Total Hazard Across Groundwater					1.8E+000
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	2.5E-001
Total Liver HI =	9.3E-002
Total Kidney HI =	9.3E-001
Total Skin HI =	1.0E-001
Total Thyroid HI =	1.0E-001
Total CNS HI =	1.4E-005
Total Respiratory Tract HI =	2.2E-007

TABLE 6-6-15  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\lacs\rsktbls\LGSAFARM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	Aluminum					Aluminum	circulatory system	2.08E-001		1.40E-003	2.10E-001
			Ammonia					Ammonia	kidney				
			Arsenic	6.90E-005		4.88E-007	6.95E-005	Arsenic	circulatory system	4.47E-001		3.18E-003	4.51E-001
			Barium					Barium	NA	2.46E-001		1.65E-003	2.47E-001
			Benzoic Acid					Benzoic Acid	GI tract	4.11E-005		7.98E-006	4.91E-005
			Beryllium					Beryllium	kidney	1.51E-002		1.90E-001	2.05E-001
			bis(2-Ethylhexyl)Phthalate	7.36E-006		5.90E-005	6.64E-005	bis(2-Ethylhexyl)Phthalate	liver	7.67E-002		6.15E-001	6.91E-001
			Chromium (VI)					Chromium (VI)		9.86E-001		6.62E-002	1.05E+000
			Cobalt					Cobalt	circulatory system	3.06E-003		2.05E-005	3.08E-003
			Copper					Copper	liver	8.58E-002		9.57E-004	8.66E-002
			Iron					Iron		1.20E+000		8.06E-003	1.21E+000
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	4.05E-001		2.72E-003	4.08E-001
			Nickel					Nickel	low body wt	1.02E-001		1.36E-003	1.03E-001
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	2.49E-001			2.49E-001
			Phenol					Phenol	liver	1.51E-002		1.79E-003	1.69E-002
			Selenium					Selenium	liver	1.64E-002		1.10E-004	1.65E-002
			Thallium					Thallium	NA	1.41E+000		9.45E-003	1.42E+000
			Toluene					Toluene	liver	1.37E-004		1.31E-004	2.68E-004
			Vanadium					Vanadium	circulatory system	4.97E-002		3.33E-004	5.00E-002
			Zinc					Zinc	thyroid	3.88E-003		5.20E-005	3.93E-003
			(Total)	7.64E-005		5.95E-005	1.36E-004	(Total)		5.52E+000		9.02E-001	6.42E+000

TABLE 6-6-15  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Receptor Population: Offsite Resident  
Receptor Age: Adult

File: c:\projects\acs\skt\bls\LG5AFARM.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	Aluminum					Aluminum	respiratory tract				
			Ammonia					Ammonia	respiratory tract		4.50E-002		4.50E-002
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzoic Acid					Benzoic Acid					
			Beryllium					Beryllium	lung				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Chromium (VI)					Chromium (VI)	respiratory tract				
			Cobalt					Cobalt					
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					
			Toluene					Toluene	CNS		2.89E-005		2.89E-005
			Vanadium					Vanadium					
			Zinc					Zinc					
			(Total)		0.00E+000		0.00E+000	(Total)			4.50E-002		4.50E-002
Total Risk Across Groundwater							1.4E-004	Total Hazard Across Groundwater					6.5E+000
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI = 7.1E-001  
Total Liver HI = 8.1E-001  
Total Kidney HI = 8.1E-001  
Total GI Tract HI = 4.9E-005  
Total CNS HI = 2.9E-005  
Total Respiratory Tract HI = 4.5E-002  
Total Thyroid HI = 3.9E-003

TABLE 6-6-16  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\LG5AFACT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5A	Aluminum					Aluminum	circulatory system	1.46E-001		3.47E-004	1.46E-001
			Ammonia					Ammonia	kidney				
			Arsenic	1.81E-005		4.54E-008	1.82E-005	Arsenic	circulatory system	3.13E-001		7.85E-004	3.14E-001
			Barium					Barium	NA	1.72E-001		4.10E-004	1.72E-001
			Benzoic Acid					Benzoic Acid	GI tract	2.88E-005		3.71E-006	3.25E-005
			Beryllium					Beryllium	kidney	1.05E-002		4.72E-002	5.78E-002
			bis(2-Ethylhexyl)Phthalate	1.93E-006		1.03E-005	1.22E-005	bis(2-Ethylhexyl)Phthalate	liver	5.37E-002		2.86E-001	3.39E-001
			Chromium (VI)					Chromium (VI)		6.90E-001		1.64E-002	7.07E-001
			Cobalt					Cobalt	circulatory system	2.14E-003		5.10E-006	2.15E-003
			Copper					Copper	liver	5.99E-002		2.38E-004	6.02E-002
			Iron					Iron		8.41E-001		2.00E-003	8.43E-001
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	2.84E-001		6.76E-004	2.85E-001
			Nickel					Nickel	low body wt	7.12E-002		3.39E-004	7.15E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	1.75E-001			1.75E-001
			Phenol					Phenol	liver	1.05E-002		8.31E-004	1.14E-002
			Selenium					Selenium	liver	1.15E-002		2.74E-005	1.15E-002
			Thallium					Thallium	NA	9.86E-001		2.35E-003	9.89E-001
			Toluene					Toluene	liver	9.59E-005		6.10E-005	1.57E-004
			Vanadium					Vanadium	circulatory system	3.48E-002		8.28E-005	3.49E-002
			Zinc					Zinc	thyroid	2.71E-003		1.29E-005	2.73E-003
			(Total)	2.01E-005		1.03E-005	3.04E-005	(Total)		3.86E+000		3.57E-001	4.22E+000

TABLE 6-6-16  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Offsite Resident
Receptor Age:	Adult

File: c:\projects\acs\risktbl\LG5AFACT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	Aluminum					Aluminum	respiratory tract				
			Ammonia					Ammonia	respiratory tract		1.32E-002		1.32E-002
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzoic Acid					Benzoic Acid					
			Beryllium					Beryllium	lung				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Chromium (VI)					Chromium (VI)	respiratory tract				
			Cobalt					Cobalt					
			Copper					Copper					
			Iron					Iron					
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Selenium					Selenium					
			Thallium					Thallium					
			Toluene					Toluene	CNS		8.48E-006		8.48E-006
			Vanadium					Vanadium					
			Zinc					Zinc					
			(Total)		0.00E+000		0.00E+000	(Total)			1.32E-002		1.32E-002
Total Risk Across Groundwater							3.0E-005	Total Hazard Across Groundwater					4.2E+000
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	5.0E-001
Total Liver HI =	4.2E-001
Total Kidney HI =	3.4E-001
Total GI Tract HI =	3.2E-005
Total CNS HI =	8.5E-006
Total Respiratory Tract HI =	1.3E-002
Total Thyroid HI =	2.7E-003

TABLE 6-7-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: c:\projects\acs\rsk\bls\UG5BFCW.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Upper Aquifer	Excavation Area 5B	2,6-Dinitrotoluene			2.05E-007	2.05E-007	2,6-Dinitrotoluene	CNS			2.82E-002	2.82E-002
			Aluminum					Aluminum	circulatory system			1.72E-003	1.72E-003
			Antimony			4.01E-006	4.01E-006	Antimony	skin			1.64E+000	1.64E+000
			Arsenic			1.25E-006	1.25E-006	Arsenic	circulatory system			2.59E-001	2.59E-001
			Barium					Barium	NA			1.19E-002	1.19E-002
			Benzene			3.72E-004	3.72E-004	Benzene	blood disorders			3.99E+002	3.99E+002
			Beryllium					Beryllium	kidney			6.36E+000	6.36E+000
			bis(2-Chloroethyl)Ether			2.59E-006	2.59E-006	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			8.59E-007	8.59E-007	bis(2-Ethylhexyl)Phthalate	liver			2.86E-001	2.86E-001
			Bromodichloromethane			2.08E-008	2.08E-008	Bromodichloromethane	liver			1.56E-003	1.56E-003
			Chloroethane			1.34E-006	1.34E-006	Chloroethane	liver			1.08E-001	1.08E-001
			Chloroform			3.42E-009	3.42E-009	Chloroform	circulatory system			5.23E-003	5.23E-003
			Chloromethane			1.19E-007	1.19E-007	Chloromethane	kidney				
			Chromium (VI)			1.31E-010	1.31E-010	Chromium (VI)				1.35E-001	1.35E-001
			Cobalt					Cobalt	circulatory system			3.04E-004	3.04E-004
			Copper					Copper	liver			2.91E-003	2.91E-003
			Iron					Iron				5.35E-001	5.35E-001
			Isophorone			2.58E-010	2.58E-010	Isophorone	kidney			1.27E-004	1.27E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney			1.79E-001	1.79E-001
			Mercury					Mercury	low body wt				
			Methylene Chloride			2.52E-007	2.52E-007	Methylene Chloride	liver			5.23E-002	5.23E-002
			Nickel					Nickel	low body wt			9.90E-003	9.90E-003
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic				
			Phenol					Phenol	liver			5.55E-003	5.55E-003
			Thallium					Thallium	NA			2.98E-001	2.98E-001



TABLE 6-7-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

File: c:\projects\acs\rsktbls\UG5BFCW.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene					Toluene	liver			2.37E-003	2.37E-003
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene	kidney			2.94E-004	2.94E-004
			Vanadium					Vanadium	circulatory system			1.79E-003	1.79E-003
			Zinc					Zinc	thyroid			1.60E-004	1.60E-004
			(Total)			3.82E-004	3.82E-004	(Total)				4.08E+002	4.08E+002
	Air	Excavation	2,6-Dinitrotoluene					2,6-Dinitrotoluene	NA				
			Aluminum					Aluminum	respiratory system				
			Antimony					Antimony	respiratory tract				
			Arsenic					Arsenic	fetotoxic				
			Barium					Barium	blood disorders		1.03E+001		1.03E+001
			Benzene		5.46E-006		5.46E-006	Benzene	lung				
			Beryllium					Beryllium	liver				
			bis(2-Chloroethyl)Ether		7.94E-008		7.94E-008	bis(2-Chloroethyl)Ether	NA				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Bromodichloromethane					Bromodichloromethane	fetotoxic		7.77E-004		7.77E-004
			Chloroethane					Chloroethane	liver				
			Chloroform					Chloroform	kidney				
			Chloromethane					Chloromethane	respiratory tract				
			Chromium (VI)					Chromium (VI)					
			Cobalt					Cobalt					
			Copper					Copper					
			Iron					Iron					
			Isophorone					Isophorone	NA				
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Mercury					Mercury	CNS				
			Methylene Chloride					Methylene Chloride	respiratory tract				
			Nickel					Nickel	respiratory tract				

TABLE 6-7-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\UG5BFCW.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Nitrate/Nitrite Phenol Thallium Toluene trans-1,2-Dichloroethene Vanadium Zinc					Nitrate/Nitrite Phenol Thallium Toluene trans-1,2-Dichloroethene Vanadium Zinc	CNS		1.62E-005		1.62E-005
			(Total)		5.54E-006		5.54E-006	(Total)			1.03E+001		1.03E+001
Total Risk Across Groundwater							3.9E-004	Total Hazard Across Groundwater					4.2E+002
Total Risk Across All Media and All Exposure Routes							3.9E-004						

Total Circulatory System HI =	2.7E-001
Total Liver HI =	4.6E-001
Total Kidney HI =	6.5E+000
Total CNS HI =	2.8E-002
Total Skin HI =	1.6E+000
Total Blood Disorders HI =	4.1E+002

TABLE 6-7-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

File: c:\projects\acs\rsktbls\LGWSBRME WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5B	4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver			1.23E-003	1.23E-003
			Acetone					Acetone	fetotoxic			3.33E-004	3.33E-004
			Aluminum					Aluminum	circulatory system			3.80E-002	3.80E-002
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin			5.26E-002	5.26E-002
			Arsenic			1.79E-004	1.79E-004	Arsenic	circulatory system			1.11E+000	1.11E+000
			Barium					Barium	NA			5.87E-002	5.87E-002
			Benzene			2.00E-004	2.00E-004	Benzene	blood disorders			6.44E+000	6.44E+000
			Benzoic Acid					Benzoic Acid	GI tract			3.10E-005	3.10E-005
			Beryllium					Beryllium	kidney			2.41E-001	2.41E-001
			bis(2-Chloroethyl)Ether			9.21E-005	9.21E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			3.80E-004	3.80E-004	bis(2-Ethylhexyl)Phthalate	liver			3.80E+000	3.80E+000
			Cadmium (water)					Cadmium (water)	kidney			3.63E+000	3.63E+000
			Chloroethane			6.41E-005	6.41E-005	Chloroethane	liver			1.55E-001	1.55E-001
			Chromium (Total as VI)					Chromium (Total as VI)				6.09E-001	6.09E-001
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system			1.05E-001	1.05E-001
			Cobalt					Cobalt	circulatory system			5.92E-004	5.92E-004
			Copper					Copper	liver			1.32E-002	1.32E-002
			Iron					Iron				4.35E-001	4.35E-001
			Isophorone			2.18E-008	2.18E-008	Isophorone	kidney			3.21E-004	3.21E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney			2.12E-001	2.12E-001
			Mercury					Mercury	low body wt				0.00E+000
			Nickel					Nickel	low body wt			6.52E-002	6.52E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic				
			Phenol					Phenol	liver			8.54E-003	8.54E-003

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
			Toluene				9.16E-004	Toluene	liver			1.78E-003	1.78E-003	
			trans-1,2-Dichloroethene					kidney	2.93E-004			2.93E-004		
			Vanadium					circulatory system	1.10E-002			1.10E-002		
			Xylene (mixed)					fetotoxic	6.33E-004			6.33E-004		
			Zinc					thyroid	1.69E-001			1.69E-001		
			(Total)									1.72E+001	1.72E+001	
	Air	Indoor Use Vapors	4-Methyl-2-Pentanone				6.28E-004	4-Methyl-2-Pentanone	CNS					
			Acetone					respiratory tract						
			Aluminum					respiratory tract	1.26E+001					1.26E+001
			Ammonia											
			Antimony					respiratory tract						
			Arsenic					fetotoxic						
			Barium					blood disorders	1.78E+001					1.78E+001
			Benzene											
			Benzoic Acid											
			Beryllium					respiratory tract						
			bis(2-Chloroethyl)Ether					liver						
			bis(2-Ethylhexyl)Phthalate					NA						
			Cadmium (water)					respiratory tract	9.78E-002					9.78E-002
			Chloroethane					fetotoxic						
			Chromium (Total as VI)					respiratory tract						
			cis-1,2-Dichloroethene											
			Cobalt											
			Copper											
			Iron											
			Isophorone					NA						
			Lead											
			Manganese (nonfood)					respiratory tract						
			Mercury					CNS						
			Nickel					respiratory tract						
			Nitrate/Nitrite											
			Phenol											

TABLE 6-7-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

File: c:\projects\acs\sktbls\LGW5BRME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene					Toluene	CNS		2.57E-003		2.57E-003
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium	CNS				
			Xylene (mixed)					Xylene (mixed)					
			Zinc					Zinc					
			(Total)		4.01E-003		4.01E-003	(Total)			3.05E+001		3.05E+001
Total Risk Across Groundwater							4.9E-003	Total Hazard Across Groundwater					4.77E+001
Total Risk Across All Media and All Exposure Routes													

Total Circulatory System HI =	1.27E+000
Total Stomach HI =	0.00E+000
Total Liver HI =	3.98E+000
Total Kidney HI =	4.09E+000
Total Fetotoxic HI =	9.88E-002
Total Skin HI =	5.26E-002
Total GI Tract HI =	3.10E-005
Total Adrenal HI =	0.00E+000
Total Thyroid HI =	1.69E-001
Total Respiratory Tract HI =	1.26E+001
Total CNS HI =	2.57E-003
Total Blood Disorders HI =	2.4E+001

TABLE 6-7-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

File: c:\project\stacs\rsktbls\LGW5BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Area 5B	4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver			8.32E-004	8.32E-004
			Acetone					Acetone	fetotoxic			2.25E-004	2.25E-004
			Aluminum					Aluminum	circulatory system			2.57E-002	2.57E-002
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin			3.55E-002	3.55E-002
			Arsenic			2.41E-005	2.41E-005	Arsenic	circulatory system			7.51E-001	7.51E-001
			Barium					Barium	NA			3.96E-002	3.96E-002
			Benzene			2.70E-005	2.70E-005	Benzene	blood disorders			4.35E+000	4.35E+000
			Benzoic Acid					Benzoic Acid	GI tract			2.09E-005	2.09E-005
			Beryllium					Beryllium	kidney			1.63E-001	1.63E-001
			bis(2-Chloroethyl)Ether			1.24E-005	1.24E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate			5.13E-005	5.13E-005	bis(2-Ethylhexyl)Phthalate	liver			2.57E+000	2.57E+000
			Cadmium (water)					Cadmium (water)	kidney			2.45E+000	2.45E+000
			Chloroethane			8.66E-006	8.66E-006	Chloroethane	liver			1.04E-001	1.04E-001
			Chromium (Total as VI)					Chromium (Total as VI)				4.11E-001	4.11E-001
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system			7.11E-002	7.11E-002
			Cobalt					Cobalt	circulatory system			3.99E-004	3.99E-004
			Copper					Copper	liver			8.91E-003	8.91E-003
			Iron					Iron				2.94E-001	2.94E-001
			Isophorone			2.94E-009	2.94E-009	Isophorone	kidney			2.16E-004	2.16E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney			1.43E-001	1.43E-001
			Mercury					Mercury	low body wt				0.00E+000
			Nickel					Nickel	low body wt			4.40E-002	4.40E-002
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic				
			Phenol					Phenol	liver			5.76E-003	5.76E-003

TABLE 6-7-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

File: c:\projects\lacs\rsktbl\LGW5BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
	Air	Indoor Use Vapors	Toluene					Toluene	liver			1.20E-003	1.20E-003
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene	kidney			1.98E-004	1.98E-004
			Vanadium					Vanadium	circulatory system			7.43E-003	7.43E-003
			Xylene (mixed)					Xylene (mixed)	fetotoxic			4.27E-004	4.27E-004
			Zinc					Zinc	thyroid			3.12E-004	3.12E-004
			(Total)			1.24E-004	1.24E-004	(Total)				1.15E+001	1.15E+001
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	CNS				
			Acetone					Acetone					
			Aluminum					Aluminum	respiratory tract				
			Ammonia					Ammonia	respiratory tract		1.10E+001		1.10E+001
			Antimony					Antimony					
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				
			Benzene		1.10E-004		1.10E-004	Benzene	blood disorders		1.56E+001		1.56E+001
			Benzoic Acid					Benzoic Acid					
			Beryllium					Beryllium	respiratory tract				
			bis(2-Chloroethyl)Ether		5.93E-004		5.93E-004	bis(2-Chloroethyl)Ether	liver				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Cadmium (water)					Cadmium (water)	respiratory tract				
			Chloroethane					Chloroethane	fetotoxic		8.57E-002		8.57E-002
			Chromium (Total as VI)					Chromium (Total as VI)	respiratory tract				
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene					
			Cobalt					Cobalt					
			Copper					Copper					
			Iron					Iron					
			Isophorone					Isophorone	NA				
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				

TABLE 6-7-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

File: c:\projects\acs\rsk\tbls\LGW5BCT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Mercury					Mercury	CNS				
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Toluene					Toluene	CNS		2.26E-003		2.26E-003
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium					
			Xylene (mixed)					Xylene (mixed)	CNS				
			Zinc					Zinc					
			(Total)		7.03E-004		7.03E-004	(Total)			2.67E+001		2.67E+001
				Total Risk Across Groundwater								Total Hazard Across Groundwater	
				8.3E-004								3.8E+001	
				Total Risk Across All Media and All Exposure Routes									

Total Circulatory System HI =	8.6E-001
Total Liver HI =	2.7E+000
Total Kidney HI =	2.8E+000
Total Fetotoxic HI =	8.6E-002
Total Skin HI =	3.6E-002
Total GI Tract HI =	2.1E-005
Total Adrenal HI =	0.0E+000
Total Thyroid HI =	3.1E-004
Total Respiratory Tract HI =	1.1E+001
Total CNS HI =	2.3E-003
Total Blood Disorders HI =	2.0E+001



Table 6-8-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Resident
Receptor Age:	Child

File: CRES6RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 6	2-Butanone					2-Butanone	liver	4.2E-008		2.3E-008	6.5E-008
			4-Methylphenol					4-Methylphenol	respiratory system	4.1E-004		3.3E-004	7.4E-004
			Acenaphthene					Acenaphthene	eyes	2.9E-005		1.5E-005	4.4E-005
			Aluminum					Aluminum	circulatory system	1.2E-001		6.3E-003	1.3E-001
			Anthracene					Anthracene	GI tract	1.1E-006		5.6E-007	1.6E-006
			Antimony					Antimony	skin	9.7E-002		5.1E-001	6.1E-001
			Arsenic	1.6E-005		2.5E-006	1.9E-005	Arsenic	circulatory system	5.7E-001		9.4E-002	6.6E-001
			Barium					Barium		1.2E-002		6.1E-004	1.2E-002
			Benzo(a)anthracene	6.6E-007		3.5E-007	1.0E-006	Benzo(a)anthracene					
			Benzo(a)pyrene	1.4E-005		8.2E-006	2.2E-005	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.7E-006		9.0E-007	2.6E-006	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	8.5E-008		4.5E-008	1.3E-007	Benzo(k)fluoranthene					
			Benzoic Acid					Benzoic Acid	GI tract	1.4E-006		7.3E-007	2.1E-006
			Beryllium					Beryllium	kidney	2.7E-003		1.4E-001	1.5E-001
			bis(2-Ethylhexyl)phthalate	3.4E-009		1.8E-009	5.2E-009	bis(2-Ethylhexyl)phthalate	liver	1.9E-004		9.9E-005	2.9E-004
			Cadmium					Cadmium	kidney	1.4E-002		1.4E-001	1.6E-001
			Carbazole	5.9E-009		3.1E-009	8.9E-009	Carbazole					
			Chloroform	2.4E-011		1.2E-011	3.6E-011	Chloroform	circulatory system	6.1E-006		3.3E-006	9.4E-006
			Chromium (total)					Chromium (total)		1.2E-002		6.3E-003	1.8E-002
			Chrysene	1.3E-008		2.7E-009	1.5E-008	Chrysene	liver				
			Copper					Copper	liver	7.9E-003		6.9E-004	8.6E-003
			Di-n-butylphthalate					Di-n-butylphthalate	liver	5.0E-007		2.7E-007	7.7E-007
			Dibenzo(a,h)anthracene	2.3E-006		1.1E-006	3.3E-006	Dibenzo(a,h)anthracene					
			Dibenzofuran					Dibenzofuran	decreased growth rate	2.1E-004		1.1E-004	3.2E-004
			Fluoranthene					Fluoranthene	kidney	3.6E-004		1.9E-004	5.5E-004
			Fluorene					Fluorene	skeletal system	4.4E-006		2.3E-006	6.7E-006
			Heptachlor	5.5E-009		2.9E-009	8.4E-009	Heptachlor	liver	3.8E-004		2.0E-004	5.8E-004
			Indeno(1,2,3-cd)pyrene	6.1E-007		3.2E-007	9.3E-007	Indeno(1,2,3-cd)pyrene					
			Iron					Iron		8.7E-001		4.6E-002	9.2E-001
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	1.6E-001		8.4E-003	1.7E-001
			Naphthalene					Naphthalene	circulatory system	4.9E-005		2.6E-005	7.5E-005
			Nickel					Nickel	low body weight	1.5E-002		1.6E-002	3.2E-002
			Pyrene					Pyrene	liver	4.1E-005		2.1E-005	8.2E-005
			Vanadium					Vanadium	circulatory system	3.8E-002		2.0E-003	4.0E-002
			Zinc					Zinc	thyroid	6.9E-003		1.2E-003	8.1E-003
			(Total)	3.6E-005		1.3E-005	4.9E-005	(Total)		1.9E+000		9.6E-001	2.9E+000
Total Risk Across Sediments				4.9E-005				Total Hazard Index Across All Exposure Routes				2.9E+000	

Total Circulatory System HI =	8.3E-001
Total Respiratory System HI =	7.4E-004
Total Skeletal System HI =	6.7E-006
Total Thyroid HI =	8.1E-003
Total Kidney HI =	4.7E-001
Total Liver HI =	9.5E-003
Total Skin HI =	6.1E-001

Table 6-8-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Resident
Receptor Age:	Child

File: CRES6CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Sediment	Sediment	Creek Area 6	2-Butanone					2-Butanone	liver	2.1E-008		7.9E-009	2.9E-008
			4-Methylphenol					4-Methylphenol	respiratory system	2.0E-004		1.1E-004	3.2E-004
			Acenaphthene					Acenaphthene	eyes	1.5E-005		5.2E-006	2.0E-005
			Aluminum					Aluminum	circulatory system	6.0E-002		2.1E-003	6.2E-002
			Anthracene					Anthracene	GI tract	5.3E-007		1.9E-007	7.2E-007
			Antimony					Antimony	skin	4.8E-002		1.7E-001	2.2E-001
			Arsenic	2.7E-006		2.8E-007	3.0E-006	Arsenic	circulatory system	2.8E-001		3.2E-002	3.2E-001
			Barium					Barium		5.8E-003		2.1E-004	6.0E-003
			Benzo(a)anthracene	1.1E-007		4.0E-008	1.5E-007	Benzo(a)anthracene					
			Benzo(a)pyrene	2.4E-006		9.4E-007	3.3E-006	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.9E-007		1.0E-007	3.9E-007	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	1.4E-008		5.1E-009	1.9E-008	Benzo(k)fluoranthene					
			Benzoic Acid					Benzoic Acid	GI tract	6.9E-007		2.5E-007	9.4E-007
			Beryllium					Beryllium	kidney	1.4E-003		4.9E-002	5.1E-002
			bis(2-Ethylhexyl)phthalate	5.7E-010		2.0E-010	7.7E-010	bis(2-Ethylhexyl)phthalate	liver	9.5E-005		3.4E-005	1.3E-004
			Cadmium					Cadmium	kidney	6.8E-003		4.9E-002	5.6E-002
			Carbazole	9.8E-010		3.5E-010	1.3E-009	Carbazole					
			Chloroform	4.0E-012		1.4E-012	5.3E-012	Chloroform	circulatory system	3.0E-006		1.1E-006	4.2E-006
			Chromium (total)					Chromium (total)		6.0E-003		2.2E-003	8.1E-003
			Chrysene	2.1E-009		3.1E-010	2.4E-009	Chrysene	liver				
			Copper					Copper	liver	3.9E-003		2.4E-004	4.2E-003
			Di-n-butylphthalate					Di-n-butylphthalate	liver	2.5E-007		9.3E-008	3.4E-007
			Dibenzo(a,h)anthracene	3.8E-007		1.2E-007	5.0E-007	Dibenzo(a,h)anthracene	decreased growth rate	1.0E-004		3.8E-005	1.4E-004
			Dibenzofuran					Dibenzofuran	kidney	1.8E-004		6.5E-005	2.5E-004
			Fluoranthene					Fluoranthene	skeletal system	2.2E-006		7.9E-007	3.0E-006
			Fluorene					Fluorene	liver	1.9E-004		6.8E-005	2.6E-004
			Heptachlor	9.2E-010		3.3E-010	1.2E-009	Heptachlor					
			Indeno(1,2,3-cd)pyrene	1.0E-007		3.6E-008	1.4E-007	Indeno(1,2,3-cd)pyrene		4.4E-001		1.6E-002	4.5E-001
			Iron					Iron					
			Lead					Lead	CNS				
			Manganese					Manganese	kidney	8.0E-002		2.9E-003	8.2E-002
			Naphthalene					Naphthalene	circulatory system	2.4E-005		8.8E-006	3.3E-005
			Nickel					Nickel	low body weight	7.7E-003		5.5E-003	1.3E-002
			Pyrene					Pyrene	liver	2.0E-005		7.3E-006	2.8E-005
			Vanadium					Vanadium	circulatory system	1.9E-002		6.8E-004	1.9E-002
			Zinc					Zinc	thyroid	3.4E-003		4.1E-004	3.8E-003
(Total)				6.0E-006		1.5E-006	7.5E-006	(Total)		9.8E-001		3.4E+000	
				Total Risk Across Sediment								Total Hazard Index Across Sediment	
												1.3E+000	

Total Circulatory System HI =	4.0E-001
Total Respiratory System HI =	3.2E-004
Total Skeletal System HI =	3.0E-006
Total Thyroid HI =	3.8E-003
Total Kidney HI =	1.9E-001
Total Liver HI =	4.6E-003
Total Skin HI =	2.2E-001

Table 6-8-3  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Resident
Receptor Age:	Adult

File: ARES6RME.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure		
Sediment	Sediment	Creek Area 6	2-Butanone					2-Butanone	liver	2.1E-008		1.3E-007	1.5E-007		
			4-Methylphenol					4-Methylphenol	respiratory system	6.2E-005		5.5E-004	6.1E-004		
			Acenaphthene					Acenaphthene	eyes	4.4E-008		2.5E-005	3.0E-005		
			Aluminum					Aluminum	circulatory system	1.8E-002		1.0E-002	2.8E-002		
			Anthracene					Anthracene	GI tract	1.8E-006		9.2E-006	1.1E-005		
			Antimony					Antimony	skin	1.5E-002		8.5E-001	8.6E-001		
			Arsenic	2.7E-007		4.5E-007	7.2E-007	Arsenic	circulatory system	8.6E-002		1.6E-001	2.4E-001		
			Barium					Barium		1.7E-003		1.0E-003	2.8E-003		
			Benzo(a)anthracene	1.1E-008		6.4E-008	7.5E-008	Benzo(a)anthracene							
			Benzo(a)pyrene	2.3E-007		1.5E-006	1.7E-006	Benzo(a)pyrene							
			Benzo(b)fluoranthene	2.8E-008		1.6E-007	1.9E-007	Benzo(b)fluoranthene							
			Benzo(k)fluoranthene	1.4E-009		8.2E-009	9.6E-009	Benzo(k)fluoranthene							
			Benzoic Acid					Benzoic Acid	GI tract	2.1E-007		1.2E-006	1.4E-006		
			Beryllium					Beryllium	kidney	4.1E-004		2.4E-001	2.4E-001		
			bis(2-Ethylhexyl)phthalate	5.6E-011		3.3E-010	3.8E-010	bis(2-Ethylhexyl)phthalate	liver	2.8E-005		1.7E-004	1.9E-004		
			Cadmium					Cadmium	kidney	2.1E-003		2.4E-001	2.4E-001		
			Carbazole	9.7E-011		5.6E-010	6.6E-010	Carbazole							
			Chloroform	3.9E-013		2.2E-012	2.6E-012	Chloroform	circulatory system	9.1E-007		5.5E-006	6.4E-006		
			Chromium (total)					Chromium (total)		1.2E-002		7.0E-002	8.2E-002		
			Chrysene	2.1E-010		5.0E-010	7.0E-010	Chrysene	liver						
			Copper					Copper	liver	1.2E-003		1.1E-003	2.3E-003		
			Di-n-butylphthalate					Di-n-butylphthalate	liver	7.5E-007		4.5E-006	5.3E-006		
			Dibenzo(a,h)anthracene	3.7E-008		1.9E-007	2.3E-007	Dibenzo(a,h)anthracene							
			Dibenzofuran					Dibenzofuran	decreased growth rate	3.1E-005		1.8E-004	2.1E-004		
			Fluoranthene					Fluoranthene	kidney	5.4E-005		3.1E-004	3.7E-004		
			Fluorene					Fluorene	skeletal system	6.6E-006		3.6E-005	4.5E-005		
			Heptachlor	9.1E-011		5.3E-010	6.2E-010	Heptachlor	liver	5.7E-006		3.3E-005	3.9E-005		
			Indeno(1,2,3-cd)pyrene	1.0E-008		5.8E-008	6.8E-008	Indeno(1,2,3-cd)pyrene							
			Iron					Iron		1.3E-001		7.6E-002	2.1E-001		
			Lead					Lead	CNS						
			Manganese					Manganese	kidney	2.4E-002		1.4E-002	3.8E-002		
			Naphthalene					Naphthalene	circulatory system	1.5E-005		8.5E-005	1.0E-004		
			Nickel					Nickel	low body weight	2.3E-003		2.7E-002	2.9E-002		
			Pyrene					Pyrene	liver	6.1E-005		3.5E-004	4.1E-004		
			Vanadium					Vanadium	circulatory system	5.7E-003		3.3E-003	9.0E-003		
			Zinc					Zinc	thyroid	1.0E-003		2.0E-003	3.0E-003		
(Total)				5.9E-007		2.4E-006	3.0E-006	(Total)		3.0E-001		1.7E+000	2.0E+000		
				Total Risk Across Sediments				3.0E-006					Total Hazard Index Across All Exposure Routes		2.0E+000

Total Circulatory System HI =	2.8E-001
Total Respiratory System HI =	6.1E-004
Total Skeletal System HI =	4.5E-005
Total Thyroid HI =	3.0E-003
Total Kidney HI =	5.2E-001
Total Liver HI =	3.0E-003
Total Skin HI =	8.6E-001

Table 6-8-4  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Services NPL Site

Scenario Timeframe:	Current/Future
Receptor Population:	Resident
Receptor Age:	Adult

File: ARES6CT.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure	
Sediment	Sediment	Creek Area 6	2-Butanone					2-Butanone	liver	1.3E-008		2.8E-008	4.1E-008	
			4-Methylphenol					4-Methylphenol	respiratory system	3.8E-005		1.2E-004	1.6E-004	
			Acenaphthene					Acenaphthene	eyes	2.7E-006		5.5E-006	8.2E-006	
			Aluminum					Aluminum	circulatory system	1.1E-002		2.2E-003	1.3E-002	
			Anthracene					Anthracene	GI tract	1.0E-006		2.0E-006	3.0E-006	
			Antimony					Antimony	skin	9.1E-003		1.8E-001	1.9E-001	
			Arsenic	1.7E-008		9.7E-009	2.7E-008	Arsenic	circulatory system	5.4E-002		3.4E-002	8.7E-002	
			Barium					Barium		1.1E-003		2.2E-004	1.3E-003	
			Benzo(a)anthracene	6.8E-010		1.4E-009	2.1E-009	Benzo(a)anthracene						
			Benzo(a)pyrene	1.5E-008		3.2E-008	4.7E-008	Benzo(a)pyrene						
			Benzo(b)fluoranthene	1.8E-009		3.5E-009	5.3E-009	Benzo(b)fluoranthene						
			Benzo(k)fluoranthene	8.8E-011		1.8E-010	2.6E-010	Benzo(k)fluoranthene						
			Benzoic Acid					Benzoic Acid	GI tract	1.3E-007		2.6E-007	3.9E-007	
			Beryllium					Beryllium	kidney	2.6E-004		5.1E-002	5.2E-002	
			bis(2-Ethylhexyl)phthalate	3.5E-012		7.0E-012	1.1E-011	bis(2-Ethylhexyl)phthalate	liver	1.8E-005		3.6E-005	5.3E-005	
			Cadmium					Cadmium	kidney	1.3E-003		5.1E-002	5.3E-002	
			Carbazole	6.0E-012		1.2E-011	1.8E-011	Carbazole						
			Chloroform	2.5E-014		4.7E-014	7.2E-014	Chloroform	circulatory system	5.7E-007		1.2E-006	1.8E-006	
			Chromium (total)					Chromium (total)		7.5E-003		1.5E-002	2.3E-002	
			Chrysene	1.3E-011		1.1E-011	2.4E-011	Chrysene	liver					
			Copper					Copper	liver	7.4E-004		2.5E-004	9.9E-004	
			Di-n-butylphthalate					Di-n-butylphthalate	liver	4.7E-007		9.7E-007	1.4E-006	
			Dibenzo(a,h)anthracene	2.3E-009		4.2E-009	6.5E-009	Dibenzo(a,h)anthracene						
			Dibenzofuran					Dibenzofuran	decreased growth rate	2.0E-005		3.9E-005	5.9E-005	
			Fluoranthene					Fluoranthene	kidney	3.4E-005		6.8E-005	1.0E-004	
			Fluorene					Fluorene	skeletal system	4.1E-008		8.2E-006	1.2E-005	
			Heptachlor	5.7E-012		1.1E-011	1.7E-011	Heptachlor	liver	3.6E-006		7.1E-006	1.1E-005	
			Indeno(1,2,3-cd)pyrene	6.3E-010		1.3E-009	1.9E-009	Indeno(1,2,3-cd)pyrene						
			Iron					Iron		8.2E-002		1.6E-002	9.9E-002	
			Lead					Lead	CNS					
			Manganese					Manganese	kidney	1.5E-002		3.0E-003	1.8E-002	
			Naphthalene					Naphthalene	circulatory system	9.2E-006		1.8E-005	2.8E-005	
			Nickel					Nickel	low body weight	1.4E-003		5.8E-003	7.2E-003	
			Pyrene					Pyrene	liver	3.8E-005		7.6E-005	1.1E-004	
			Vanadium					Vanadium	circulatory system	3.5E-003		7.1E-004	4.2E-003	
			Zinc					Zinc	thyroid	6.5E-004		4.3E-004	1.1E-003	
(Total)				3.7E-008		5.3E-008	9.0E-008	(Total)		1.9E-001		3.6E-001	5.5E-001	
				Total Risk Across Sediment								Total Hazard Index Across Sediment		5.5E-001

Total Circulatory System HI =	1.1E-001
Total Respiratory System HI =	1.6E-004
Total Skeletal System HI =	1.2E-005
Total Thyroid HI =	1.1E-003
Total Kidney HI =	1.2E-001
Total Liver HI =	1.2E-003
Total Skin HI =	1.9E-001

TABLE 6-9-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Worker *
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Areas 1, 2, 3, and 4B	4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	1.54E-003		1.49E-004	1.69E-003
			Acetone					Acetone	fetotoxic	3.01E-003		3.10E-005	3.04E-003
			Aluminum					Aluminum	circulatory system	2.05E-001		1.13E-003	2.07E-001
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	2.84E-001		1.56E-003	2.86E-001
			Arsenic	9.17E-004		1.97E-001	1.97E-001	Arsenic	circulatory system	5.71E+000		3.29E-002	5.74E+000
			Barium					Barium	NA	3.17E-001		1.74E-003	3.19E-001
			Benzene	4.40E-005		9.99E-003	9.99E-003	Benzene	blood disorders	1.42E+000		6.87E-001	2.10E+000
			Benzoic Acid					Benzoic Acid	GI tract	2.05E-005		4.31E-006	2.49E-005
			Beryllium					Beryllium	kidney	1.30E-002		7.13E-003	2.01E-002
			bis(2-Chloroethyl)Ether	2.37E-004		4.84E-002	4.84E-002	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	6.37E-006		1.30E-003	1.30E-003	bis(2-Ethylhexyl)Phthalate	liver	6.37E-002		5.51E-001	6.15E-001
			Cadmium (water)					Cadmium (water)	kidney	9.81E-001		1.07E-001	1.09E+000
			Chloroethane	4.11E-005				Chloroethane	liver	9.93E-002		1.50E-002	1.14E-001
			Chromium (Total as VI)					Chromium (Total as VI)		1.64E+000		1.80E-002	1.66E+000
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system	5.27E-002		1.25E-002	6.53E-002
			Cobalt					Cobalt	circulatory system	3.20E-003		1.75E-005	3.21E-003
			Copper					Copper	liver	4.28E-002		3.91E-004	4.32E-002
			Iron					Iron		2.35E+000		1.29E-002	2.36E+000
			Isophorone	2.32E-008		4.75E-006	4.75E-006	Isophorone	kidney	3.42E-004		4.84E-005	3.91E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	1.14E+000		6.26E-003	1.15E+000
			Mercury					Mercury	low body wt				
			Nickel					Nickel	low body wt	1.76E-001		1.93E-003	1.78E-001
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	1.44E-001			1.44E-001
			Phenol					Phenol	liver	7.76E-003		9.95E-004	8.76E-003
			Toluene					Toluene	liver	2.05E-004		2.13E-004	4.18E-004
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene	kidney	1.37E-003		3.48E-005	1.40E-003
			Vanadium					Vanadium	circulatory system	5.95E-002		3.26E-004	5.98E-002
			Xylene (mixed)					Xylene (mixed)	fetotoxic	4.11E-005		1.21E-004	1.62E-004
			Zinc					Zinc	thyroid	1.52E+000		5.00E-003	1.53E+000
			(Total)	1.25E-003		2.57E-001	2.57E-001	(Total)		1.62E+001		1.46E+000	1.77E+001
	Air	Indoor Use Vapors	4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	CNS		1.83E-003		1.83E-003
			Acetone					Acetone					
			Aluminum					Aluminum	respiratory tract				
			Ammonia					Ammonia	respiratory tract		5.25E-001		5.25E-001
			Antimony					Antimony					
			Arsenic					Arsenic	respiratory tract				
			Barium					Barium	fetotoxic				

TABLE 6-9-1  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Worker *
Receptor Age:	Adult

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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Benzene		1.72E-006		1.72E-006	Benzene	blood disorders		7.43E-001		7.43E-001
			Benzoic Acid					Benzoic Acid					
			Beryllium					Beryllium	respiratory tract				
			bis(2-Chloroethyl)Ether		9.26E-006		9.26E-006	bis(2-Chloroethyl)Ether	liver				
			bis(2-Ethylhexyl)Phthalate					bis(2-Ethylhexyl)Phthalate	NA				
			Cadmium (water)					Cadmium (water)	respiratory tract				
			Chloroethane					Chloroethane	fetotoxic		4.08E-003		4.08E-003
			Chromium (Total as VI)					Chromium (Total as VI)	respiratory tract				
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene					
			Cobalt					Cobalt					
			Copper					Copper					
			Iron					Iron					
			Isophorone					Isophorone	NA				
			Lead					Lead					
			Manganese (nonfood)					Manganese (nonfood)	respiratory tract				
			Mercury					Mercury	CNS				
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol					
			Toluene					Toluene	CNS		1.07E-004		1.07E-004
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium					
			Xylene (mixed)					Xylene (mixed)	CNS				
			Zinc					Zinc					
			(Total)		1.10E-005		1.10E-005	(Total)			1.27E+000		1.27E+000
Total Risk Across Groundwater							2.6E-001	Total Risk Across Groundwater					1.9E+001
Total Risk Across All Media and All Exposure Routes													

\* Worker - Includes routine and utility maintenance workers

Total Circulatory System HI =	6.1E+000
Total Liver HI =	7.8E-001
Total Kidney HI =	2.3E+000
Total Fetotoxic HI =	1.5E-001
Total Skin HI =	2.9E-001
Total GI Tract HI =	2.5E-005
Total Adrenal HI =	0.0E+000
Total Thyroid HI =	1.5E+000
Total Respiratory Tract HI =	5.2E-001
Total CNS HI =	1.9E-003
Total Blood Disorders HI =	2.8E+000

TABLE 6-9-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Worker *
Receptor Age:	Adult

File: c:\projects\lacs\sktbls\LGVRCTA.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
Groundwater	Lower Aquifer	Tap Water Areas 1, 2, 3, and 4B	4-Methyl-2-Pentanone					4-Methyl-2-Pentanone	liver	9.64E-004		8.00E-005	1.04E-003
			Acetone					Acetone	fetotoxic	1.89E-003		1.67E-005	1.90E-003
			Aluminum					Aluminum	circulatory system	1.29E-001		4.29E-004	1.29E-001
			Ammonia					Ammonia	kidney				
			Antimony					Antimony	skin	1.78E-001		5.93E-004	1.78E-001
			Arsenic	1.15E-004		4.03E-007	1.15E-004	Arsenic	circulatory system	3.57E+000		1.25E-002	3.58E+000
			Barium					Barium	NA	1.98E-001		6.61E-004	1.99E-001
			Benzene	5.50E-006		2.30E-006	5.50E-006	Benzene	blood disorders	8.86E-001		3.70E-001	1.26E+000
			Benzoic Acid					Benzoic Acid	GI tract	1.29E-005		2.32E-006	1.52E-005
			Beryllium					Beryllium	kidney	8.14E-003		2.71E-003	1.09E-002
			bis(2-Chloroethyl)Ether	2.96E-005		1.78E-006	2.96E-005	bis(2-Chloroethyl)Ether	reproductive				
			bis(2-Ethylhexyl)Phthalate	7.97E-007		5.94E-006	7.97E-007	bis(2-Ethylhexyl)Phthalate	liver	3.99E-002		2.97E-001	3.37E-001
			Cadmium (water)					Cadmium (water)	kidney	6.14E-001		4.09E-002	6.55E-001
			Chloroethane	5.15E-006		6.70E-007	5.15E-006	Chloroethane	liver	6.21E-002		8.09E-003	7.02E-002
			Chromium (Total as VI)					Chromium (Total as VI)		1.03E+000		6.86E-003	1.04E+000
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	circulatory system	3.30E-002		6.74E-003	3.97E-002
			Cobalt					Cobalt	circulatory system	2.00E-003		6.67E-006	2.01E-003
			Copper					Copper	liver	2.68E-002		1.49E-004	2.69E-002
			Iron					Iron		1.47E+000		4.90E-003	1.48E+000
			Isophorone	2.91E-009		3.54E-010	2.91E-009	Isophorone	kidney	2.14E-004		2.61E-005	2.40E-004
			Lead					Lead	CNS				
			Manganese (nonfood)					Manganese (nonfood)	kidney	7.16E-001		2.39E-003	7.18E-001
			Mercury					Mercury	low body wt				
			Nickel					Nickel	low body wt	1.10E-001		7.34E-004	1.11E-001
			Nitrate/Nitrite					Nitrate/Nitrite	fetotoxic	9.00E-002			9.00E-002
			Phenol					Phenol	liver	4.86E-003		5.36E-004	5.39E-003

TABLE 6-9-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Worker *
Receptor Age:	Adult

File: c:\projects\lacs\skibis\LG0VRC\TA.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Toluene trans-1,2-Dichloroethene Vanadium Xylene (mixed) Zinc (Total)	1.56E-004		1.11E-005	1.56E-004	Toluene trans-1,2-Dichloroethene Vanadium Xylene (mixed) Zinc (Total)	liver kidney circulatory system fetotoxic thyroid	1.29E-004 8.57E-004 3.72E-002 2.57E-005 9.51E-001 1.02E+001		1.15E-004 1.87E-005 1.24E-004 6.52E-005 1.90E-003 7.58E-001	2.43E-004 8.76E-004 3.73E-002 9.09E-005 9.53E-001 1.09E+001
	Air	Indoor Use Vapors	4-Methyl-2-Pentanone Acetone Aluminum Ammonia Antimony Arsenic Barium Benzene Benzoic Acid Beryllium bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chloroethane Chromium (Total as VI) cis-1,2-Dichloroethene Cobalt Copper Iron Isophorone Lead Manganese (nonfood)		1.72E-006      9.26E-006		1.72E-006   9.26E-006	4-Methyl-2-Pentanone Acetone Aluminum Ammonia Antimony Arsenic Barium Benzene Benzoic Acid Beryllium bis(2-Chloroethyl)Ether bis(2-Ethylhexyl)Phthalate Cadmium (water) Chloroethane Chromium (Total as VI) cis-1,2-Dichloroethene Cobalt Copper Iron Isophorone Lead Manganese (nonfood)	CNS  respiratory tract respiratory tract  respiratory tract fetotoxic blood disorders  respiratory tract liver NA respiratory tract fetotoxic respiratory tract  NA respiratory tract		1.21E-003  3.45E-001  4.88E-001  2.68E-003	1.21E-003  3.45E-001  4.88E-001  2.68E-003	



TABLE 6-9-2  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY  
American Chemical Service NPL Site

Scenario Timeframe:	Future
Receptor Population:	Worker *
Receptor Age:	Adult

File: c:\projects\lacs\lrs\lrb\lsg\GOVRCTA.WK4

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Total Exposure		Primary Target Organ	Ingestion	Inhalation	Dermal	Total Exposure
			Mercury					Mercury	CNS				
			Nickel					Nickel	respiratory tract				
			Nitrate/Nitrite					Nitrate/Nitrite					
			Phenol					Phenol	CNS		7.05E-005		7.05E-005
			Toluene					Toluene					
			trans-1,2-Dichloroethene					trans-1,2-Dichloroethene					
			Vanadium					Vanadium	CNS				
			Xylene (mixed)					Xylene (mixed)					
			Zinc					Zinc					
			(Total)		1.10E-005		1.10E-005	(Total)			8.36E-001		8.36E-001
				Total Risk Across Groundwater								Total Risk Across Groundwater	
				1.7E-004								1.2E+001	
				Total Risk Across All Media and All Exposure Routes									

\* Worker - Includes routine and utility workers

Total Circulatory System HI =	3.8E+000
Total Liver HI =	4.4E-001
Total Kidney HI =	1.4E+000
Total Fetotoxic HI =	9.5E-002
Total Skin HI =	1.8E-001
Total GI Tract HI =	1.5E-005
Total Adrenal HI =	0.0E+000
Total Thyroid HI =	9.5E-001
Total Respiratory Tract HI =	3.4E-001
Total CNS HI =	1.3E-003
Total Blood Disorders HI =	1.7E+000

TABLE 7-1  
SUMMARY OF RME RECEPTOR RISKS FOR CURRENT LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 1</b>								
Routine Worker								
Surface Soil (0' to 2')	$6.2 \times 10^{-6}$	$4.6 \times 10^{-6}$	$4.4 \times 10^{-4}$	$4.5 \times 10^{-4}$	0.4	0.5	63	63
Sediment	$2.0 \times 10^{-6}$	--	$1.3 \times 10^{-4}$	$1.3 \times 10^{-4}$	0.1	--	8	8
Surface Water	$5.1 \times 10^{-8}$	--	$2.3 \times 10^{-5}$	$2.3 \times 10^{-5}$	0.06	--	0.05	0.1
Groundwater, Lower Aquifer	$1.6 \times 10^{-2}$	$1.2 \times 10^{-3}$	$1.9 \times 10^{-3}$	$1.9 \times 10^{-2}$	470	3,000	58	3,500
Total Risk Across All Media and Exposure Routes				$2.0 \times 10^{-2}$				<b>3,600</b>
Utility Worker								
Soil (0' to 10')	$5.0 \times 10^{-4}$	$5.2 \times 10^{-4}$	$2.6 \times 10^{-2}$	$2.7 \times 10^{-2}$	13	130	850	1,000
Sediment	$1.8 \times 10^{-5}$	--	$1.3 \times 10^{-4}$	$1.5 \times 10^{-4}$	1	--	8	9
Groundwater, Upper Aquifer	--	$3.8 \times 10^{-6}$	$3.2 \times 10^{-4}$	$3.2 \times 10^{-4}$	--	77	3000	3,100
Total Risk Across All Media and Exposure Routes				$2.7 \times 10^{-2}$				<b>4,100</b>
<b>AREA 2</b>								
Utility Worker								
Soil (2' to 10')	$3.2 \times 10^{-3}$	$4.6 \times 10^{-4}$	$1.6 \times 10^{-1}$	$1.6 \times 10^{-1}$	4	17	2,800	2,800
Total Risk Across All Media and Exposure Routes				$1.6 \times 10^{-1}$				<b>2,800</b>
Trespasser								
Soil (2' to 4')	$2.5 \times 10^{-4}$	$7.6 \times 10^{-7}$	$1.2 \times 10^{-2}$	$1.2 \times 10^{-2}$	23	0.4	2,100	2,100
Sediment	$5.0 \times 10^{-7}$	--	$3.0 \times 10^{-6}$	$3.5 \times 10^{-6}$	0.03	--	0.3	0.3
Total Risk Across All Media and Exposure Routes				$1.2 \times 10^{-2}$				<b>2,100</b>
<b>AREA 3</b>								
Utility Worker								
Soil (0' to 10')	$1.5 \times 10^{-3}$	$9.1 \times 10^{-4}$	$7.8 \times 10^{-2}$	$8.0 \times 10^{-2}$	19	13	6,900	7,000
Total Risk Across All Media and Exposure Routes				$8.0 \times 10^{-2}$				<b>7,000</b>
Trespasser								
Soil (0' to 2')	$1.1 \times 10^{-5}$	$4.5 \times 10^{-7}$	$4.8 \times 10^{-4}$	$4.9 \times 10^{-4}$	1	0.1	570	570
Total Risk Across All Media and Exposure Routes				$4.9 \times 10^{-4}$				<b>570</b>

TABLE 7-1  
SUMMARY OF RME RECEPTOR RISKS FOR CURRENT LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 4A</b>								
Trespasser								
Sediment	2.6x10 <sup>-6</sup>	--	1.0x10 <sup>-5</sup>	1.3x10 <sup>-5</sup>	0.4	--	2	2
Surface Water	9.1x10 <sup>-7</sup>	9.2x10 <sup>-7</sup>	7.7x10 <sup>-7</sup>	2.6x10 <sup>-6</sup>	0.4	0.9	0.2	2
Total Risk Across All Media and Exposure Routes				1.6x10 <sup>-5</sup>				4
<b>AREA 4B</b>								
Trespasser								
Sediment	1.6x10 <sup>-6</sup>	--	7.8x10 <sup>-6</sup>	9.4x10 <sup>-6</sup>	0.3	--	2	2
Surface Water	5.1x10 <sup>-6</sup>	--	2.0x10 <sup>-6</sup>	7.1x10 <sup>-6</sup>	0.02	--	0.02	0.03
Total Risk Across All Media and Exposure Routes				1.7x10 <sup>-5</sup>				2
<b>AREA 5A</b>								
Child Resident								
Surface Soil (0' to 2')	8.4x10 <sup>-6</sup>	1.1x10 <sup>-5</sup>	9.4x10 <sup>-5</sup>	1.1x10 <sup>-4</sup>	2	5	520	530
Groundwater, Lower Aquifer	5.4x10 <sup>-5</sup>	2.2x10 <sup>-9</sup>	2.1x10 <sup>-4</sup>	2.6x10 <sup>-4</sup>	9	0.000002	0.0002	9
Total Risk Across All Media and Exposure Routes				3.7x10 <sup>-4</sup>				540
Adult Resident								
Surface Soil (0' to 2')	3.6x10 <sup>-6</sup>	9.1x10 <sup>-6</sup>	2.2x10 <sup>-4</sup>	2.3x10 <sup>-4</sup>	0.2	1	310	310
Groundwater, Lower Aquifer	6.5x10 <sup>-5</sup>	6.0x10 <sup>-7</sup>	2.4x10 <sup>-6</sup>	6.7x10 <sup>-5</sup>	3	0.04	0.1	3
Total Risk Across All Media and Exposure Routes				3.0x10 <sup>-4</sup>				310
Cumulative Excess Lifetime Cancer Risk for Residents (Adult + Child)				6.0x10 <sup>-4</sup>				
<b>AREA 6</b>								
Child Resident								
Sediment	3.6x10 <sup>-5</sup>	--	1.3x10 <sup>-5</sup>	4.9x10 <sup>-5</sup>	2	--	1	3
Total Risk Across All Media and Exposure Routes				4.9x10 <sup>-5</sup>				3
Adult Resident								
Sediment	5.9x10 <sup>-7</sup>	--	2.4x10 <sup>-6</sup>	3.0x10 <sup>-6</sup>	0.3	--	2	2
Total Risk Across All Media and Exposure Routes				3.0x10 <sup>-6</sup>				2
Cumulative Excess Lifetime Cancer Risk for Residents (Adult + Child)				5.2x10 <sup>-5</sup>				

TABLE 7-2  
SUMMARY OF CENTRAL TENDENCY RECEPTOR RISKS FOR CURRENT LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 1</b>								
Routine Worker								
Surface Soil (0' to 2')	$5.4 \times 10^{-7}$	$8.0 \times 10^{-7}$	$1.3 \times 10^{-5}$	$1.5 \times 10^{-5}$	0.2	0.5	9	10
Sediment	$1.7 \times 10^{-7}$	--	$3.9 \times 10^{-6}$	$4.1 \times 10^{-6}$	0.05	--	1	1
Surface Water	$1.4 \times 10^{-8}$	--	$7.4 \times 10^{-6}$	$7.4 \times 10^{-6}$	0.004	--	0.003	0.007
Groundwater, Lower Aquifer	$1.9 \times 10^{-3}$	$1.2 \times 10^{-3}$	$1.5 \times 10^{-5}$	$3.2 \times 10^{-3}$	290	2,000	2	2,300
Total Risk Across All Media and Exposure Routes				$3.2 \times 10^{-3}$				2,300
Utility Worker								
Soil (0' to 10')	$1.7 \times 10^{-6}$	$2.1 \times 10^{-6}$	$1.8 \times 10^{-5}$	$2.2 \times 10^{-5}$	16	200	210	430
Sediment	$1.4 \times 10^{-6}$	--	$3.9 \times 10^{-6}$	$5.3 \times 10^{-6}$	0.4	--	1	2
Groundwater, Upper Aquifer	--	$6.6 \times 10^{-7}$	$4.8 \times 10^{-5}$	$4.9 \times 10^{-5}$	--	67	2,300	2,300
Total Risk Across All Media and Exposure Routes				$7.6 \times 10^{-5}$				2,700
<b>AREA 2</b>								
Utility Worker								
Soil (2' to 10')	$2.5 \times 10^{-4}$	$8.1 \times 10^{-5}$	$4.9 \times 10^{-3}$	$5.2 \times 10^{-3}$	2	15	420	430
Total Risk Across All Media and Exposure Routes				$5.2 \times 10^{-3}$				430
Trespasser								
Soil (2' to 4')	$5.7 \times 10^{-6}$	$1.7 \times 10^{-8}$	$8.6 \times 10^{-5}$	$9.1 \times 10^{-5}$	6	0.1	180	180
Sediment	$1.1 \times 10^{-8}$	--	$2.2 \times 10^{-8}$	$3.3 \times 10^{-8}$	0.008	--	0.02	0.03
Total Risk Across All Media and Exposure Routes				$9.1 \times 10^{-5}$				180
<b>AREA 3</b>								
Utility Worker								
Soil (0' to 10')	$1.2 \times 10^{-4}$	$1.6 \times 10^{-4}$	$2.3 \times 10^{-3}$	$2.6 \times 10^{-3}$	7	11	1,000	1,100
Total Risk Across All Media and Exposure Routes				$2.6 \times 10^{-3}$				1,100
Trespasser								
Soil (0' to 2')	$2.4 \times 10^{-7}$	$1.0 \times 10^{-8}$	$3.5 \times 10^{-6}$	$3.8 \times 10^{-6}$	0.3	0.04	48	48
Total Risk Across All Media and Exposure Routes				$3.8 \times 10^{-6}$				48

**TABLE 7-2**  
**SUMMARY OF CENTRAL TENDENCY RECEPTOR RISKS FOR CURRENT LAND USE SCENARIOS**  
**American Chemical Service NPL Site**

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 4A</b>								
Trespasser								
Sediment	$5.7 \times 10^{-8}$	--	$7.3 \times 10^{-8}$	$1.3 \times 10^{-7}$	0.09	--	0.2	0.3
Surface Water	$2.9 \times 10^{-8}$	$3.3 \times 10^{-8}$	$4.8 \times 10^{-8}$	$1.1 \times 10^{-7}$	0.1	0.5	0.1	0.7
Total Risk Across All Media and Exposure Routes				$2.4 \times 10^{-7}$				1
<b>AREA 4B</b>								
Trespasser								
Sediment	$3.6 \times 10^{-8}$	--	$5.7 \times 10^{-8}$	$9.2 \times 10^{-8}$	0.07	--	0.2	0.2
Surface Water	$1.3 \times 10^{-7}$	--	$4.9 \times 10^{-8}$	$1.8 \times 10^{-7}$	0.005	--	0.006	0.01
Total Risk Across All Media and Exposure Routes				$2.7 \times 10^{-7}$				0.3
<b>AREA 5A</b>								
Child Resident								
Surface Soil (0' to 2')	$4.2 \times 10^{-6}$	$8.0 \times 10^{-6}$	$1.6 \times 10^{-5}$	$2.8 \times 10^{-5}$	0.9	4	89	94
Groundwater, Lower Aquifer	$1.3 \times 10^{-5}$	$1.1 \times 10^{-9}$	$1.1 \times 10^{-10}$	$1.3 \times 10^{-5}$	2	0.0000008	0.00002	2
Total Risk Across All Media and Exposure Routes				$4.1 \times 10^{-5}$				96
Adult Resident								
Surface Soil (0' to 2')	$6.7 \times 10^{-7}$	$2.6 \times 10^{-6}$	$1.4 \times 10^{-5}$	$1.8 \times 10^{-5}$	0.09	0.8	53	54
Groundwater, Lower Aquifer	$1.7 \times 10^{-5}$	$6.5 \times 10^{-8}$	$4.6 \times 10^{-7}$	$1.7 \times 10^{-5}$	2	0.01	0.03	2
Total Risk Across All Media and Exposure Routes				$3.5 \times 10^{-5}$				56
Cumulative Excess Lifetime Cancer Risk for Residents (Adult + Child)				$7.6 \times 10^{-5}$				
<b>AREA 6</b>								
Child Resident								
Sediment	$6.0 \times 10^{-6}$	--	$1.5 \times 10^{-6}$	$7.5 \times 10^{-6}$	1	--	0.3	1
Total Risk Across All Media and Exposure Routes				$7.5 \times 10^{-6}$				1
Adult Resident								
Sediment	$3.7 \times 10^{-8}$	--	$5.3 \times 10^{-8}$	$9.0 \times 10^{-8}$	0.2	--	0.4	0.6
Total Risk Across All Media and Exposure Routes				$9.0 \times 10^{-8}$				0.6
Cumulative Excess Lifetime Cancer Risk for Residents (Adult + Child)				$7.6 \times 10^{-6}$				

TABLE 7-3  
SUMMARY OF RME RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 1</b>								
Routine Worker								
Soil (0' to 10')	3.8x10 <sup>-4</sup>	9.6x10 <sup>-5</sup>	2.6x10 <sup>-2</sup>	2.7x10 <sup>-2</sup>	10	17	850	880
Sediment	2.0x10 <sup>-6</sup>	--	1.3x10 <sup>-4</sup>	1.3x10 <sup>-4</sup>	0.1	--	8	8
Surface Water	5.1x10 <sup>-8</sup>	--	2.3x10 <sup>-5</sup>	2.3x10 <sup>-5</sup>	0.06	--	0.05	0.1
Groundwater, Lower Aquifer (Sitewide)	1.3x10 <sup>-3</sup>	1.1x10 <sup>-5</sup>	2.6x10 <sup>-1</sup>	2.6x10 <sup>-1</sup>	16	1	2	19
Total Risk Across All Media and Exposure Routes				<b>2.9x10<sup>-1</sup></b>				<b>910</b>
Utility Worker								
Soil (0' to 10')	5.0x10 <sup>-4</sup>	5.2x10 <sup>-4</sup>	2.6x10 <sup>-2</sup>	2.7x10 <sup>-2</sup>	13	130	850	1,000
Sediment	1.8x10 <sup>-5</sup>	--	1.3x10 <sup>-4</sup>	1.5x10 <sup>-4</sup>	1	--	8	9
Groundwater, Upper Aquifer	--	3.8x10 <sup>-6</sup>	3.2x10 <sup>-4</sup>	3.2x10 <sup>-4</sup>	--	77	3,000	3,100
Groundwater, Lower Aquifer (Sitewide)	1.3x10 <sup>-3</sup>	1.1x10 <sup>-5</sup>	2.6x10 <sup>-1</sup>	2.6x10 <sup>-1</sup>	16	1	2	19
Total Risk Across All Media and Exposure Routes				<b>2.9x10<sup>-1</sup></b>				<b>4,100</b>
Construction Worker								
Soil (0' to 4')	6.2x10 <sup>-4</sup>	2.5x10 <sup>-5</sup>	7.5x10 <sup>-3</sup>	8.2x10 <sup>-3</sup>	140	210	2,100	2,400
Surface Water	9.2x10 <sup>-9</sup>	--	4.8x10 <sup>-6</sup>	4.8x10 <sup>-6</sup>	0.02	--	0.02	0.04
Groundwater, Upper Aquifer	--	6.4x10 <sup>-5</sup>	4.8x10 <sup>-3</sup>	4.9x10 <sup>-3</sup>	--	120	4,200	4,300
Total Risk Across All Media and Exposure Routes				<b>1.3x10<sup>-2</sup></b>				<b>6,700</b>
Trespasser								
Soil (0' to 10')	2.6x10 <sup>-5</sup>	9.7x10 <sup>-7</sup>	2.4x10 <sup>-3</sup>	2.4x10 <sup>-3</sup>	3	0.7	340	340
Sediment	1.9x10 <sup>-6</sup>	--	1.2x10 <sup>-5</sup>	1.4x10 <sup>-5</sup>	0.5	--	3	4
Surface Water	1.8x10 <sup>-8</sup>	--	5.2x10 <sup>-6</sup>	5.2x10 <sup>-6</sup>	0.005	--	0.004	0.009
Total Risk Across All Media and Exposure Routes				<b>2.4x10<sup>-3</sup></b>				<b>340</b>
<b>AREA 2</b>								
Routine Worker								
Soil (0' to 10')	2.4x10 <sup>-3</sup>	8.5x10 <sup>-5</sup>	1.6x10 <sup>-1</sup>	1.6x10 <sup>-1</sup>	3	10	2,800	2,800
Sediment	1.0x10 <sup>-6</sup>	--	3.3x10 <sup>-5</sup>	3.4x10 <sup>-5</sup>	0.02	--	0.7	0.8
Surface Water	2.9x10 <sup>-5</sup>	--	1.9x10 <sup>-5</sup>	4.8x10 <sup>-5</sup>	0.8	--	1	2
Groundwater, Lower Aquifer (Sitewide)	1.3x10 <sup>-3</sup>	1.1x10 <sup>-5</sup>	2.6x10 <sup>-1</sup>	2.6x10 <sup>-1</sup>	16	1	2	20
Total Risk Across All Media and Exposure Routes				<b>4.2x10<sup>-1</sup></b>				<b>2,800</b>

TABLE 7-3  
SUMMARY OF RME RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
Utility Worker								
Soil (2' to 10')	$3.2 \times 10^{-3}$	$4.6 \times 10^{-4}$	$1.6 \times 10^{-1}$	$1.6 \times 10^{-1}$	4	17	2,800	2,800
Sediment	$9.6 \times 10^{-6}$	--	$3.3 \times 10^{-5}$	$4.2 \times 10^{-5}$	0.1	--	0.7	0.9
Groundwater, Lower Aquifer (Sitewide)	$1.3 \times 10^{-3}$	$1.1 \times 10^{-5}$	$2.6 \times 10^{-1}$	$2.6 \times 10^{-1}$	16	1	2	19
Total Risk Across All Media and Exposure Routes				$4.2 \times 10^{-1}$				2,800
Construction Worker								
Soil (2' to 4')	$3.2 \times 10^{-4}$	$8.5 \times 10^{-5}$	$4.0 \times 10^{-3}$	$4.4 \times 10^{-3}$	220	10	5,600	5,800
Soil (2' to 10')	$4.2 \times 10^{-4}$	$2.2 \times 10^{-5}$	$5.0 \times 10^{-3}$	$5.5 \times 10^{-3}$	16	27	2,900	2,900
Total Risk Across All Media and Exposure Routes				$9.9 \times 10^{-3}$				8,700
Trespasser								
Soil (2' to 10')	$3.3 \times 10^{-4}$	$8.6 \times 10^{-7}$	$1.5 \times 10^{-2}$	$1.5 \times 10^{-2}$	2	0.4	1,100	1,100
Sediment	$5.0 \times 10^{-7}$	--	$3.0 \times 10^{-6}$	$3.5 \times 10^{-6}$	0.03	--	0.3	0.3
Surface Water	$1.8 \times 10^{-6}$	--	$7.3 \times 10^{-7}$	$2.6 \times 10^{-6}$	0.06	--	0.06	0.1
Total Risk Across All Media and Exposure Routes				$1.5 \times 10^{-2}$				1,100
AREA 3								
Routine Worker								
Soil (0' to 10')	$1.3 \times 10^{-3}$	$1.1 \times 10^{-4}$	$7.8 \times 10^{-2}$	$7.9 \times 10^{-2}$	16	5	6,900	7,000
Groundwater, Lower Aquifer (Sitewide)	$1.3 \times 10^{-3}$	$1.1 \times 10^{-5}$	$2.6 \times 10^{-1}$	$2.6 \times 10^{-1}$	16	1	2	19
Total Risk Across All Media and Exposure Routes				$3.4 \times 10^{-1}$				7,020
Utility Worker								
Soil (0' to 10')	$1.5 \times 10^{-3}$	$9.1 \times 10^{-4}$	$7.8 \times 10^{-2}$	$8.0 \times 10^{-2}$	19	13	6,900	7,000
Groundwater, Lower Aquifer (Sitewide)	$1.3 \times 10^{-3}$	$1.1 \times 10^{-5}$	$2.6 \times 10^{-1}$	$2.6 \times 10^{-1}$	16	1	2	19
Total Risk Across All Media and Exposure Routes				$3.4 \times 10^{-1}$				7,020
Construction Worker								
Soil (0' to 4')	$5.5 \times 10^{-5}$	$2.2 \times 10^{-5}$	$6.7 \times 10^{-4}$	$7.5 \times 10^{-4}$	12	16	1,900	1,900
Soil (0' to 10')	$2.0 \times 10^{-4}$	$4.3 \times 10^{-5}$	$2.4 \times 10^{-3}$	$2.7 \times 10^{-3}$	81	20	7,300	7,400
Total Risk Across All Media and Exposure Routes				$3.5 \times 10^{-3}$				9,300
Trespasser								
Soil (0' to 10')	$1.6 \times 10^{-4}$	$2.3 \times 10^{-6}$	$7.1 \times 10^{-3}$	$7.3 \times 10^{-3}$	8	0.4	2,700	2,700
Total Risk Across All Media and Exposure Routes				$7.3 \times 10^{-3}$				2,700

TABLE 7-3  
SUMMARY OF RME RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 4A</b>								
Trespasser								
Sediment	2.6x10 <sup>-6</sup>	--	1.0x10 <sup>-5</sup>	1.3x10 <sup>-5</sup>	0.4	--	2	2
Surface Water	9.1x10 <sup>-7</sup>	9.2x10 <sup>-7</sup>	7.7x10 <sup>-7</sup>	2.6x10 <sup>-6</sup>	0.4	0.9	0.2	2
Total Risk Across All Media and Exposure Routes				1.6x10 <sup>-5</sup>				4
<b>AREA 4B</b>								
Routine Worker								
Sediment	1.3x10 <sup>-5</sup>	--	8.5x10 <sup>-5</sup>	9.8x10 <sup>-5</sup>	0.5	--	5	6
Surface Water	2.3x10 <sup>-6</sup>	--	2.8x10 <sup>-6</sup>	5.1x10 <sup>-6</sup>	0.007	--	0.03	0.03
Groundwater, Lower Aquifer (Sitewide)	1.3x10 <sup>-3</sup>	1.1x10 <sup>-5</sup>	2.6x10 <sup>-1</sup>	2.6x10 <sup>-1</sup>	16	1	2	19
Total Risk Across All Media and Exposure Routes				2.6x10 <sup>-1</sup>				25
Utility Worker								
Sediment	1.5x10 <sup>-5</sup>	--	8.5x10 <sup>-5</sup>	1.0x10 <sup>-4</sup>	0.6	--	5	6
Groundwater, Upper Aquifer	--	1.4x10 <sup>-3</sup>	1.5x10 <sup>-2</sup>	1.6x10 <sup>-2</sup>	--	77	370	450
Groundwater, Lower Aquifer (Sitewide)	1.3x10 <sup>-3</sup>	1.1x10 <sup>-5</sup>	2.6x10 <sup>-1</sup>	2.6x10 <sup>-1</sup>	16	1	2	19
Total Risk Across All Media and Exposure Routes				2.8x10 <sup>-1</sup>				470
Construction Worker								
Sediment	2.0x10 <sup>-6</sup>	--	2.7x10 <sup>-6</sup>	4.7x10 <sup>-6</sup>	2	--	6	8
Groundwater, Upper Aquifer	--	6.4x10 <sup>-5</sup>	4.8x10 <sup>-3</sup>	4.8x10 <sup>-3</sup>	--	120	4,200	4,300
Total Risk Across All Media and Exposure Routes				4.8x10 <sup>-3</sup>				4,300
Trespasser								
Sediment	1.6x10 <sup>-6</sup>	--	7.8x10 <sup>-6</sup>	9.4x10 <sup>-6</sup>	0.3	--	2	2
Surface Water	5.1x10 <sup>-6</sup>	--	2.0x10 <sup>-6</sup>	7.1x10 <sup>-6</sup>	0.02	--	0.02	3
Total Risk Across All Media and Exposure Routes				1.7x10 <sup>-5</sup>				5
<b>AREA 5A</b>								
Child Resident								
Surface Soil (0' to 2')	8.4x10 <sup>-6</sup>	1.1x10 <sup>-5</sup>	9.4x10 <sup>-5</sup>	1.1x10 <sup>-4</sup>	2	5	520	530
Groundwater, Upper Aquifer	3.0x10 <sup>-5</sup>	--	7.5x10 <sup>-5</sup>	1.0x10 <sup>-4</sup>	7	--	23	30
Groundwater, Lower Aquifer	6.4x10 <sup>-5</sup>	0.0x10 <sup>0</sup>	2.9x10 <sup>-8</sup>	6.4x10 <sup>-5</sup>	16	0.0007	0.002	16
Total Risk Across All Media and Exposure Routes				2.7x10 <sup>-4</sup>				580



TABLE 7-3  
SUMMARY OF RME RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
Adult Resident								
Surface Soil (0' to 2')	3.6x10 <sup>-6</sup>	9.1x10 <sup>-6</sup>	2.2x10 <sup>-4</sup>	2.3x10 <sup>-4</sup>	0.2	1	310	310
Groundwater, Upper Aquifer	9.4x10 <sup>-6</sup>	--	2.6x10 <sup>-5</sup>	3.5x10 <sup>-5</sup>	0.3	--	1	1
Groundwater, Lower Aquifer	7.6x10 <sup>-5</sup>	0.0x10 <sup>0</sup>	6.0x10 <sup>-5</sup>	1.4x10 <sup>-4</sup>	6	0.05	0.9	7
Total Risk Across All Media and Exposure Routes				4.1x10 <sup>-4</sup>				320
Cumulative Excess Lifetime Cancer Risk for Resident (Adult + Child)				6.8x10 <sup>-4</sup>				
AREA 5B								
Construction Worker								
Groundwater, Upper Aquifer	--	5.5x10 <sup>-6</sup>	3.8x10 <sup>-4</sup>	3.9x10 <sup>-4</sup>	--	10	410	420
Total Risk Across All Media and Exposure Routes				3.9x10 <sup>-4</sup>				420
Commercial Worker								
Groundwater, Lower Aquifer	--	4.0x10 <sup>-3</sup>	9.2x10 <sup>-4</sup>	4.9x10 <sup>-3</sup>	--	31	17	48
Total Risk Across All Media and Exposure Routes				4.9x10 <sup>-3</sup>				48
AREA 6								
Child Resident								
Sediment	3.6x10 <sup>-5</sup>	--	1.3x10 <sup>-5</sup>	4.9x10 <sup>-5</sup>	2	--	1	3
Total Risk Across All Media and Exposure Routes				4.9x10 <sup>-5</sup>				3
Adult Resident								
Sediment	5.9x10 <sup>-7</sup>	--	2.4x10 <sup>-6</sup>	3.0x10 <sup>-6</sup>	0.3	--	2	2
Total Risk Across All Media and Exposure Routes				3.0x10 <sup>-6</sup>				2
Cumulative Excess Lifetime Cancer Risk for Resident (Adult + Child)				5.2x10 <sup>-5</sup>				

TABLE 7-4  
SUMMARY OF CENTRAL TENDENCY RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>AREA 1</b>								
Routine Worker								
Soil (0' to 10')	3.3x10 <sup>-5</sup>	1.7x10 <sup>-5</sup>	7.9x10 <sup>-4</sup>	8.4x10 <sup>-4</sup>	4	15	130	150
Sediment	1.7x10 <sup>-7</sup>	--	3.9x10 <sup>-6</sup>	4.1x10 <sup>-6</sup>	0.05	--	1	1
Surface Water	1.4x10 <sup>-8</sup>	--	7.4x10 <sup>-6</sup>	7.4x10 <sup>-6</sup>	0.004	--	0.003	0.007
Groundwater, Lower Aquifer (Sitewide)	1.6x10 <sup>-4</sup>	1.1x10 <sup>-5</sup>	1.1x10 <sup>-5</sup>	1.7x10 <sup>-4</sup>	10	0.8	0.8	12
Total Risk Across All Media and Exposure Routes				<b>1.0x10<sup>-3</sup></b>				<b>160</b>
Utility Worker								
Soil (0' to 10')	1.7x10 <sup>-6</sup>	2.1x10 <sup>-6</sup>	1.8x10 <sup>-5</sup>	2.2x10 <sup>-5</sup>	16	200	210	430
Sediment	1.4x10 <sup>-6</sup>	--	3.9x10 <sup>-6</sup>	5.3x10 <sup>-6</sup>	0.4	--	1	2
Groundwater, Upper Aquifer	--	6.6x10 <sup>-7</sup>	4.8x10 <sup>-5</sup>	4.9x10 <sup>-5</sup>	--	67	2,300	2,300
Groundwater, Lower Aquifer (Sitewide)	1.6x10 <sup>-4</sup>	1.1x10 <sup>-5</sup>	1.1x10 <sup>-5</sup>	1.7x10 <sup>-4</sup>	10	0.8	0.8	12
Total Risk Across All Media and Exposure Routes				<b>2.5x10<sup>-4</sup></b>				<b>2,700</b>
Trespasser								
Soil (0' to 10')	5.8x10 <sup>-7</sup>	2.2x10 <sup>-8</sup>	1.7x10 <sup>-5</sup>	1.8x10 <sup>-5</sup>	0.8	0.2	28	29
Sediment	4.3x10 <sup>-8</sup>	--	8.6x10 <sup>-8</sup>	1.3x10 <sup>-7</sup>	0.1	--	0.3	0.4
Surface Water	3.9x10 <sup>-10</sup>	--	1.3x10 <sup>-7</sup>	1.3x10 <sup>-7</sup>	0.001	--	0.0007	0.002
Total Risk Across All Media and Exposure Routes				<b>1.8x10<sup>-5</sup></b>				<b>29</b>
<b>AREA 2</b>								
Routine Worker								
Soil (0' to 10')	2.1x10 <sup>-4</sup>	1.5x10 <sup>-5</sup>	4.9x10 <sup>-3</sup>	5.1x10 <sup>-3</sup>	1	9	420	430
Sediment	9.1x10 <sup>-8</sup>	--	9.9x10 <sup>-7</sup>	1.1x10 <sup>-6</sup>	0.007	--	0.1	0.1
Surface Water	5.1x10 <sup>-6</sup>	--	2.9x10 <sup>-6</sup>	8.0x10 <sup>-6</sup>	0.7	--	1	2
Groundwater, Lower Aquifer (Sitewide)	1.6x10 <sup>-4</sup>	1.1x10 <sup>-5</sup>	1.1x10 <sup>-5</sup>	1.7x10 <sup>-4</sup>	10	0.8	0.8	12
Total Risk Across All Media and Exposure Routes				<b>5.3x10<sup>-3</sup></b>				<b>440</b>
Utility Worker								
Soil (2' to 10')	2.5x10 <sup>-4</sup>	8.1x10 <sup>-5</sup>	4.9x10 <sup>-3</sup>	5.2x10 <sup>-3</sup>	2	15	420	430
Sediment	3.3x10 <sup>-8</sup>	--	2.3x10 <sup>-8</sup>	5.6x10 <sup>-8</sup>	0.003	--	0.003	0.005
Groundwater, Lower Aquifer (Sitewide)	1.6x10 <sup>-4</sup>	1.1x10 <sup>-5</sup>	1.1x10 <sup>-5</sup>	1.7x10 <sup>-4</sup>	10	0.8	0.8	12
Total Risk Across All Media and Exposure Routes				<b>5.4x10<sup>-3</sup></b>				<b>440</b>

**TABLE 7-4**  
**SUMMARY OF CENTRAL TENDENCY RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS**

**American Chemical Service NPL Site**

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
<b>Trespasser</b>								
Soil (2' to 10')	$7.4 \times 10^{-6}$	$1.9 \times 10^{-8}$	$1.1 \times 10^{-4}$	$1.1 \times 10^{-4}$	0.4	0.1	92	93
Sediment	$1.1 \times 10^{-8}$	--	$2.2 \times 10^{-8}$	$3.3 \times 10^{-8}$	0.008	--	0.02	0.03
Surface Water	$3.9 \times 10^{-8}$	--	$1.6 \times 10^{-8}$	$5.5 \times 10^{-8}$	0.01	--	0.01	0.03
<b>Total Risk Across All Media and Exposure Routes</b>				$1.1 \times 10^{-4}$				<b>93</b>
<b>AREA 3</b>								
<b>Routine Worker</b>								
Soil (0' to 10')	$1.2 \times 10^{-4}$	$2.0 \times 10^{-5}$	$2.3 \times 10^{-3}$	$2.5 \times 10^{-3}$	7	4	1,000	1,000
Groundwater, Lower Aquifer (Sitewide)	$1.6 \times 10^{-4}$	$1.1 \times 10^{-5}$	$1.1 \times 10^{-5}$	$1.7 \times 10^{-4}$	10	0.8	0.8	12
<b>Total Risk Across All Media and Exposure Routes</b>				$2.7 \times 10^{-3}$				<b>1,000</b>
<b>Utility Worker</b>								
Soil (0' to 10')	$1.2 \times 10^{-4}$	$1.6 \times 10^{-4}$	$2.3 \times 10^{-3}$	$2.6 \times 10^{-3}$	7	11	1,000	1,000
Groundwater, Lower Aquifer (Sitewide)	$1.6 \times 10^{-4}$	$1.1 \times 10^{-5}$	$1.1 \times 10^{-5}$	$1.7 \times 10^{-4}$	10	0.8	0.8	12
<b>Total Risk Across All Media and Exposure Routes</b>				$2.8 \times 10^{-3}$				<b>1,000</b>
<b>Trespasser</b>								
Soil (0' to 10')	$3.6 \times 10^{-6}$	$5.1 \times 10^{-8}$	$5.2 \times 10^{-5}$	$5.6 \times 10^{-5}$	2	0.1	230	230
<b>Total Risk Across All Media and Exposure Routes</b>				$5.6 \times 10^{-5}$				<b>230</b>
<b>AREA 4A</b>								
<b>Trespasser</b>								
Sediment	$5.7 \times 10^{-8}$	--	$7.3 \times 10^{-8}$	$1.3 \times 10^{-7}$	0.09	--	0.2	0.3
Surface Water	$2.9 \times 10^{-8}$	$3.3 \times 10^{-8}$	$4.8 \times 10^{-8}$	$1.1 \times 10^{-7}$	0.1	0.5	0.1	0.7
<b>Total Risk Across All Media and Exposure Routes</b>				$2.4 \times 10^{-7}$				<b>1</b>
<b>AREA 4B</b>								
<b>Routine Worker</b>								
Sediment	$1.2 \times 10^{-6}$	--	$2.6 \times 10^{-6}$	$3.7 \times 10^{-6}$	0.2	--	0.8	1
Surface Water	$1.1 \times 10^{-7}$	--	$1.2 \times 10^{-7}$	$2.4 \times 10^{-7}$	0.002	--	0.006	0.007
Groundwater, Lower Aquifer (Sitewide)	$1.6 \times 10^{-4}$	$1.1 \times 10^{-5}$	$1.1 \times 10^{-5}$	$1.7 \times 10^{-4}$	10	0.8	0.8	12
<b>Total Risk Across All Media and Exposure Routes</b>				$1.7 \times 10^{-4}$				<b>13</b>
<b>Utility Worker</b>								
Sediment	$1.2 \times 10^{-6}$	--	$2.6 \times 10^{-6}$	$3.8 \times 10^{-6}$	0.2	--	0.8	1
Groundwater, Upper Aquifer	--	$3.7 \times 10^{-6}$	$4.8 \times 10^{-5}$	$5.2 \times 10^{-5}$	--	77	240	320
Groundwater, Lower Aquifer (Sitewide)	$1.6 \times 10^{-4}$	$1.1 \times 10^{-5}$	$1.1 \times 10^{-5}$	$1.7 \times 10^{-4}$	10	0.8	0.8	12
<b>Total Risk Across All Media and Exposure Routes</b>				$2.3 \times 10^{-4}$				<b>330</b>

TABLE 7-4  
SUMMARY OF CENTRAL TENDENCY RECEPTOR RISKS FOR FUTURE LAND USE SCENARIOS  
American Chemical Service NPL Site

	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
	Ingestion	Inhalation	Dermal	Total Exposure	Ingestion	Inhalation	Dermal	Total Exposure
Trespasser								
Sediment	$3.6 \times 10^{-8}$	--	$5.7 \times 10^{-8}$	$9.2 \times 10^{-8}$	0.07	--	0.2	0.2
Surface Water	$1.3 \times 10^{-7}$	--	$4.9 \times 10^{-8}$	$1.8 \times 10^{-7}$	0.005	--	0.006	0.01
Total Risk Across All Media and Exposure Routes				$2.7 \times 10^{-7}$				0.2
AREA 5A								
Child Resident								
Surface Soil (0' to 2')	$4.2 \times 10^{-6}$	$8.0 \times 10^{-6}$	$1.6 \times 10^{-5}$	$2.8 \times 10^{-5}$	0.9	4	89	94
Groundwater, Upper Aquifer	$2.5 \times 10^{-6}$	--	$8.4 \times 10^{-6}$	$1.1 \times 10^{-5}$	0.6	--	2	3
Groundwater, Lower Aquifer	$1.6 \times 10^{-5}$	$0.0 \times 10^0$	$3.9 \times 10^{-9}$	$1.6 \times 10^{-5}$	4	0.0003	0.0002	4
Total Risk Across All Media and Exposure Routes				$5.5 \times 10^{-5}$				100
Adult Resident								
Surface Soil (0' to 2')	$6.7 \times 10^{-7}$	$2.6 \times 10^{-6}$	$1.4 \times 10^{-5}$	$1.8 \times 10^{-5}$	0.09	0.8	53	54
Groundwater, Upper Aquifer	$3.5 \times 10^{-6}$	--	$8.3 \times 10^{-6}$	$1.2 \times 10^{-5}$	0.3	--	0.9	1
Groundwater, Lower Aquifer	$2.0 \times 10^{-5}$	$0.0 \times 10^0$	$1.0 \times 10^{-5}$	$3.0 \times 10^{-5}$	4	0.01	0.4	4
Total Risk Across All Media and Exposure Routes				$6.0 \times 10^{-5}$				59
Cumulative Excess Lifetime Cancer Risk for Resident (Adult + Child)				$1.1 \times 10^{-4}$				
AREA 5B								
Commercial Worker								
Groundwater, Lower Aquifer	--	$7.0 \times 10^{-4}$	$1.2 \times 10^{-4}$	$8.3 \times 10^{-4}$	--	27	12	38
Total Risk Across All Media and Exposure Routes				$8.3 \times 10^{-4}$				38
AREA 6								
Child Resident								
Sediment	$6.0 \times 10^{-6}$	--	$1.5 \times 10^{-6}$	$7.5 \times 10^{-6}$	1	--	0.3	1
Total Risk Across All Media and Exposure Routes				$7.5 \times 10^{-6}$				1
Adult Resident								
Sediment	$3.7 \times 10^{-8}$	--	$5.3 \times 10^{-8}$	$9.0 \times 10^{-8}$	0.2	--	0.4	0.6
Total Risk Across All Media and Exposure Routes				$9.0 \times 10^{-8}$				0.6
Cumulative Excess Lifetime Cancer Risk for Resident (Adult + Child)				$7.6 \times 10^{-6}$				

